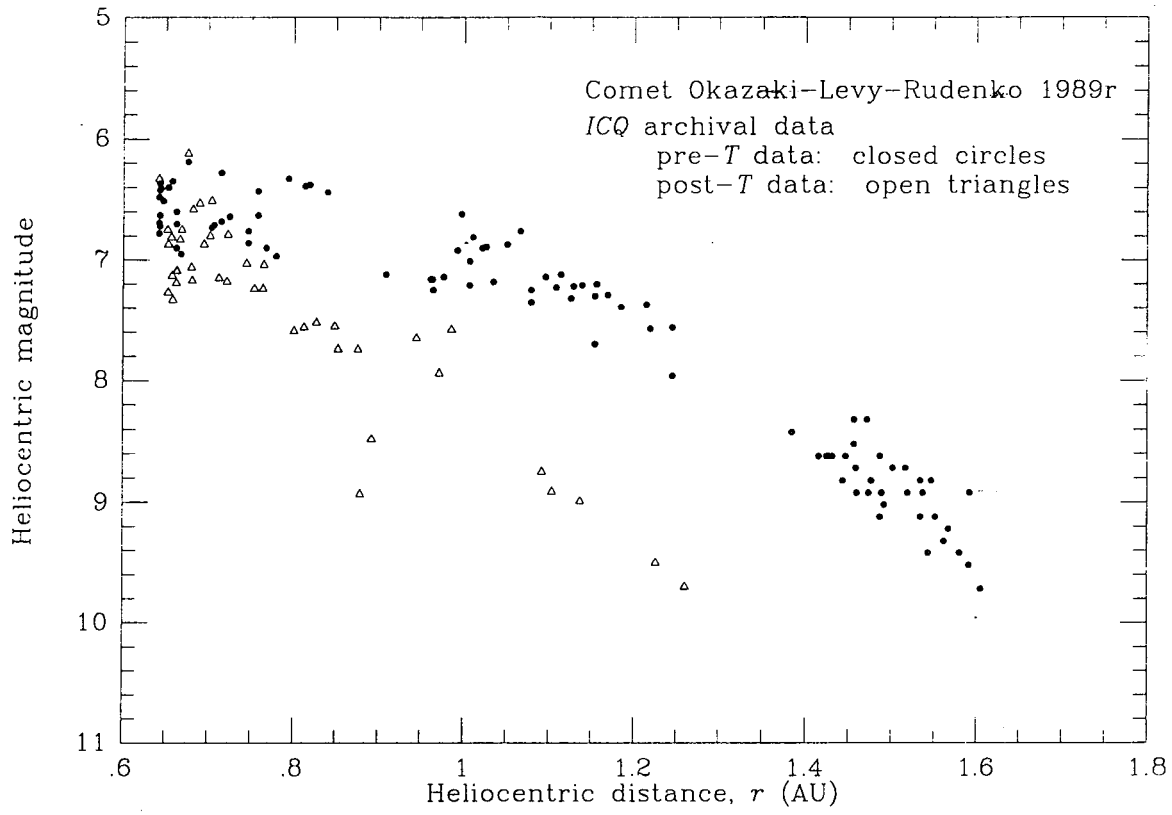
THE INTERNATIONAL COMET QUARTERLY

Whole Number 75 **JULY 1990** **Vol. 12, No. 3**



Above is a plot of the heliocentric magnitude of comet Okazaki-Levy-Rudenko 1989r versus its heliocentric distance. The heliocentric magnitudes are from 141 total visual magnitude estimates made by seven experienced observers during 1989 Aug. 26-1990 Jan. 5. Note how the comet was intrinsically brighter before the time of perihelion (T) than after T.

SMITHSONIAN ASTROPHYSICAL OBSERVATORY
60 Garden Street, Cambridge, MA 02138

Centennial Year 1990

The International Comet Quarterly (*ICQ*) is a journal devoted to news and observation of comets, published by the Smithsonian Astrophysical Observatory in Cambridge, Massachusetts. Regular issues are published 4 times per year (January, April, July, and October), with an annual *Comet Handbook* of ephemerides published normally as a special fifth issue. An index to each volume normally is published in every other January issue (even-numbered years); the *ICQ* is also indexed in *Astronomy and Astrophysics Abstracts* and in *Science Abstracts Section A*.

The regular (invoiced) subscription rate is US$24.00 per year (price includes the annual *Comet Handbook*; the price without the *Handbook* is US$16.00 per year). Subscribers who do not wish to be billed may subscribe at the special rate of US$18.00 per year, or US$20.00/year outside North America (rates are $10.00 and $12.00, respectively, without *Handbook*). [The last set of digits (after the hyphen) on the top line of the mailing address label gives the Whole Number that signifies the last *ICQ* issue which will be sent under the current subscription status.] Make checks or money orders payable in U.S. funds (and drawn on a U.S. bank) to *International Comet Quarterly* and send to Daniel Green; Smithsonian Astrophysical Observatory; 60 Garden St.; Cambridge, MA 02138, U.S.A. [Group subscription rates available upon request.] Back issues are $4.00 each — *except* for "current" *Comet Handbooks*, which are available for $10.00 ($8.00 to subscribers if ordered with their *ICQ* subscription; see above). Up-to-date information concerning comet discoveries, orbital elements, and ephemerides can be obtained by subscribing to the *IAU Circulars* and/or the *Minor Planet Circulars* (via postal mail and also available via computer access); for further information, contact the *ICQ* Editor at the above address.

Manuscripts will be reviewed for possible publication (send 2 copies of typed, double-spaced copy to the Editor at the Cambridge address above); authors should first obtain a copy of "Information and Guidelines for Authors" from the Editor. Cometary observations also should be sent to the Editor in Cambridge; all data intended for publication in the *ICQ* should be sent on standard *ICQ* observation report forms, which can be obtained upon request from the Editor. Those who can send manuscripts and observational data in machine-readable form are encouraged to do so [especially through mail via the computer networks *BITNET* (GREEN@CFA) or *SPAN* (CFAPS2::GREEN), or via floppy disks], and should contact the Editor for further information.

Among the Observation Coordinators (OCs) listed below, those with postal addresses have e-mail contacts with the *ICQ* Editor; observers in the general area of such OCs who lack access to e-mail networks may send data to the OC for relay to the *ICQ* in electronic form.

++++++++++++

This issue is No. 75 of the publication originally called *The Comet* (founded March 1973) and is Vol. 12, No. 3, of the *ICQ*. *[ISSN 0736-6922]*

****

OBSERVATION COORDINATORS

In recognition of several individuals who have been most helpful in collecting and forwarding observations to the *ICQ* for publication, we are establishing "Observations Coordinators" (OCs), as listed above. Those OCs who contribute data via computer electronic mail (e-mail) are given with their full postal addresses above, so that observers who lack access to e-mail networks may send report forms to OCs who are geographically close to them. In particular, Alfredo Pereira has offered to collect observations for any observers in southern Europe (France, Spain, Italy, etc.) who do not have access to e-mail. Any other individuals with access to e-mail networks who would like to help forward data to the *ICQ* should contact the Editor at one of the above e-mail addresses.

We have already asked individuals in several other countries to be OCs, for whom we are awaiting a reply. Through this process, we hope to improve communication with observers, to speed up the transmission of observational data for publication, and to more standardize and improve such factors as methods employed for magnitude estimates of comets.

Φ Φ Φ

— CORRIGENDUM —

• In the April 1990 issue, page 68, Periodic Comet Wild 4 (1990a), the observation on 1990 Mar. 30.92 UT with the 31.6-cm reflector was by observer MID01, *not* GRA04.

TABULATION OF COMET OBSERVATIONS

Descriptive Information (to complement the Tabulated Data):

◇ *Comet Okazaki-Levy-Rudenko 1989r* ⟹ 1989 Aug. 30.83: at 167×, 0°.07 tail in p.a. 111° [GAR02]. Sept. 28.80: in 20.3-cm *f*/10 T 167×, 0°.1 tail in p.a. 54°; 3 jets visible: 27″ in p.a. 145°, 20″ in p.a. 323°, and 30″ at p.a. 211° and curved to p.a. 177° [GAR02]. Oct. 1.90 and 2.90: in 31.6-cm *f*/5 L (130×), coma dia. 3′, DC = 5 [MID01]. Oct. 3.81: in 31.6-cm *f*/5 L (130×), coma dia. 5′, DC = 6 [MID01]. Oct. 7.81-7.83: "during this period, the nearly-starlike central cond. changed its appearance from barely seen to quite evident, twice — mag ~ 10 when evident" [PER01]. Oct. 8.83: at 108×, coma dia. 2′.1, DC = 3-4, hint of a nucleus [PER01]. Oct. 31.72: in 7×50 B, m_1 ~ 5.9, coma dia. 2′, DC = 5 [HEE]. Nov. 2.75: in 7×50 B, m_1 ~ 5.8, coma dia. 1′, DC = 6 [HEE].

◇ *Comet Helin-Roman-Alu 1989v* ⟹ 1989 Nov. 18.78: "comet very obvious: outburst?" [BOU]. Nov. 21.76: in 31.6-cm *f*/5 L (130×), coma dia. 2′, DC = 3 [MID01]. Nov. 22.75: in 31.6-cm *f*/5 L (130×), coma dia. 3′, DC = 3 [MID01]. Dec. 2.74: in 25.6-cm *f*/4 L (96×), m_1 ~ 10, coma dia. 3′.5, DC = 2 [Magne A. Svanemsli, Norway]. 1990 Jan. 18.76: comet close to 9th-mag star [BOU].

◇ *Comet Aarseth-Brewington 1989a*$_1$ ⟹ 1989 Nov. 17.73: in 31.6-cm *f*/5 L (130×), coma dia. 2′.5, DC = 5 [MID01]. Nov. 21.7: in 20.3-cm *f*/10 T (80×), m_1 = 8.3, DC = 3 [Trond Larsen, Norway]. Dec. 6.70: in 20.3-cm *f*/10 T (80×), 0°.25 tail in p.a. 4° [DAH]. Dec. 9: 10-min exp. w/ 200-mm *f*/4 telephoto lens yields 1°.5 tail in p.a. 345°.9 [GAR02]. Dec. 13.26: in 10×50 B, m_1 ~ 4.0 (RF: SC) [Nils Brynildsen, Norway]. Dec. 14.25: in 5.6-cm *f*/5 R (30×), m_1 = 5.0, coma dia. 5, DC = 7, 0°.83 tail in p.a. 302° [Magne A. Svanemsli, Norway]. Dec. 15.24: in 10×50 B, m_1 ~ 5.2 (RF: SC) [Nils Brynildsen, Norway]. Dec. 20.26: in 5.0-cm R (8×), m_1 = 3.5 [MID01].

◇ *Comet Skorichenko-George 1989e*$_1$ ⟹ 1989 Dec. 20-1990 Apr. 19: "extinction corrections applied where necessary to magnitude determinations" [BOR]. 1989 Dec. 25.74: in Celestron 20.3-cm *f*/10 T (167×), 0°.04 tail in p.a. 78°, 0′.8 jet in p.a. 192° [GAR02]. 1990 Feb. 18.01: in 31.7-cm L, "very small false nucleus of mag 11.5-12" [BOR]. Feb. 21.01: diffuse coma w/ central cond. of dia. 0′.6 [BOR]. Feb. 22.00: "tiny false nucleus" [BOR]. Mar. 19.03: "nucleus of mag 13" [BOR]. Mar. 22.02: "nucleus of mag 12.5-13" [BOR]. Mar. 24.03: "dense center but very diffuse outer halo" [BOR]. Apr. 14.05: "tiny central knot" [BOR]. Apr. 19.05: different AC chart used (vs. Apr. 14) [BOR].

◇ *Comet Černis-Kiuchi-Nakamura 1990b* ⟹ 1990 Apr. 9.85: "tail extremely faint and elusive" [KOR]. Mar. 24.04: in 31.7-cm L, "nucleus of mag 12.5-13" [BOR]. Mar. 26.04: in 31.7-cm L, "nucleus much weaker" [BOR]. Mar. 27.05: "noticeably fainter!"; in 31.7-cm L, "no nucleus" [BOR]. Apr. 4.18: interference from moonlight [HAL]. Apr. 18.09: "comet much fainter" [BOR]. Apr. 21.20: "comet significantly fainter and more diffuse than during previous observations" [HAL]. May 12.16: "comet searched for with both 83× and 183×, with and without C_2 filter; no candidates suspected" [HAL].

◇ *Comet Levy 1990c [all notes by MOR]* ⟹ 1990 May 21.44: "nearly stellar cond." June 2.44: in 26-cm L, parabolic coma and nearly stellar cond. June 3.43: in 26-cm L, cond. offset in coma toward N.

◇ *Periodic Comet Russell 3 (1989d) [all notes by HAL]* ⟹ 1990 Apr. 20.45: "seeing fairly poor; also, possibly some interference from moonlight". Apr. 26.43: "very rich star field — comet position is on SE edge of globular cluster M4". May 4.40: "comet quite close to bright star (σ Sco)".

◇ *Periodic Comet Brorsen-Metcalf (1989o)* ⟹ 1989 Aug. 3.1: in Celestron 20.3-cm T (80×), faint 0°.5 tail; "coma has four concentric envelopes with decreasing contrast" [GAR02]. Aug. 4.0: in 8×50 finderscope, coma dia. ~ 12′-13′; in Celestron 20.3-cm T (80×), 0°.25 tail in p.a. ~ 260° [GAR02]. Aug. 9.1: in 11×80 B, coma dia. 14′, 45′tail glimpsed at p.a. 271° [GAR02]. Aug. 12.1: in Celestron 12.7-cm T (20×), 1° tail in p.a. 285° [GAR02]. Aug. 13.1: in 12×80 B, 1°.8 tail in p.a. 282°; 25-min exp. w/ 200-mm *f*/4 telephoto lens shows 3°.38 tail in p.a. 283°.1 [GAR02]. Sept. 8.16: in Celestron 12.7-cm T (51×), coma dia. 2′, DC = 7, 0°.58 tail in p.a. 310° [GAR02].

◇ *Periodic Comet Lovas 1 (1989p)* ⟹ 1989 Nov. 25.20: involved with mag 14 star [BOU]. Nov. 29.20: close to mag 10 star [BOU].

◇ *Periodic Comet Tuttle-Giacobini-Kresák (1989b*$_1$*)* ⟹ 1990 Jan. 24.68: "very similar to comet 1989c$_1$ on 1989 Dec. 7 [CAM03].

◇ *Periodic Comet Schwassmann-Wachmann 3 (1989d*$_1$*)* ⟹ 1990 Mar. 24.48: comet elongated (1′.9 × 2′.9) toward W [MOR]. Mar. 29.48: "bright starlike cond. on leading edge of fan-shaped coma" [HAL]. Mar. 31.49 and Apr. 1.48: "parabolic shaped coma" [MOR]. Apr. 21.46: "the fan-shaped coma appears to diffuse into a faint, westward-pointing tail" [HAL]. Apr. 22.69: in 20-cm *f*/7 L (56×), coma dia. = 3′, DC = 8, m_1 ~ 10 [CAM03]. Apr. 23.35 and 24.34: "very strange looking coma, highly elongated, looking like an edgewise galaxy — appearance very similar to that of P/Tuttle-Giacobini-Kresak after outburst (1973 May); extinction corrections applied as necessary to determinations" [BOR]. Apr. 26.74: in 20×80 B, "like a spiral galaxy" [CAM03]. Apr. 27.73: "tail of low surface brightness" [CAM03]. May 4.45: "altitude somewhat low, some interference from skyglow; the west-pointing tail first seen on Apr. 21 is still visible" [HAL]. May 27.46: m_1 = 9.5-10.0 (no formal estimate made) [MOR].

◇ *Periodic Comet Wild 4 (1990a)* ⟹ 1990 Mar. 22.06: in 50-cm L, "nucleus of mag 14.0" [BOR]. Apr. 13.07: "nucleus of mag 14" [BOR]. Apr. 14.07: "stellar nucleus of mag 13.3" [BOR]. Apr. 18.10 and 19.09: "coma fan-shaped NW-SE" [BOR].

◇ *Comet Austin (1989c$_1$)* ⟹ 1989 Dec. 22.53 UT: "elongated E-W" [GAR01]. 1990 Feb. 17.47: in 20-cm L, sunward spike 5′ long in p.a. 355° [CAM03]. Feb. 20-Apr. 28: "extinction corrections applied where necessary to determinations" [BOR]. Mar. 15.42: "like comet 1987s" [CAM03]. Mar. 21.08: "central cond. occasionally starlike" [ROB03]. Mar. 22.01: "almost starlike" [BOR]. Mar. 24.01: "very sharply condensed" [BOR]. Mar. 24.14: "broad fan tail suspected" [MOR]. Mar. 25.13: "using 30-cm L (50×, 100×), parabolic coma w/ stellar cond.; no tail was obvious" [MOR]. Mar. 26.14: "fan-shaped tail toward S suspected" [MOR]. Mar. 28.10: in 41 cm L, two tails observed; one of these appears to be an extension of a faint fan surrounding the inner coma [HAL].

Apr. 1.15: "broad, faint tail" [MOR]. Apr. 2.10: altitude fairly low; some interference from clouds. In 41 cm L and 20 cm L, the comet is little more than a bright condensation with a faint filmy tail [HAL]. Apr. 5.83: in 20.3-cm *f*/10 T (80×), coma dia. ~ 2′.5, DC = 9 [BRE02]. Apr. 9.11: altitude very low; interference from twilight, moonlight and cirrus. The comet is little more than a condensation with some diffuseness; comet is barely visible in 10x50 B [HAL]. Apr. 11.11: altitude very low; comet is little more than a condensation [HAL]. Apr. 13.92: in 20.3-cm *f*/10 T (80×), coma dia. 1′.5, DC = 7 [ANO]. Apr. 14.49: altitude very low; bright twilight. The brightness estimate is little more than a guess [HAL]. Apr. 17.14: in 20-cm L, 0°.2 jet in p.a. 30° [BOA]. Apr. 18.37: narrow, straight tail [BOR]. Apr. 19.37: in 31.7-cm L, "dense central knot" [BOR]. Apr. 19.47: some cirrus in comet's vicinity, plus some interference from low altitude and twilight [HAL]. Apr. 20.23: "comet clearly less bright and less condensed than yesterday; comet seen via naked eye; in 10×50 B, 4° very narrow tail seen clearly, first half degree somewhat broader and quite bright, with a pronounced 'kink' 2° from head; a much broader and more diffuse extension to perhaps 10° was suspected; no naked-eye tail; quite bright stellar nuclear cond. offset from center in solar direction; round, moderately-condensed inner coma and a probable large, faint, diffuse outer coma seen initially in dark sky" [KID]. Apr. 20.46: comet just barely visible to naked eye [HAL]. Apr. 20.90: in 20.3-cm *f*/10 T (50×), coma dia. 2′, DC = 7 [BRE02]. Apr. 21.23: "2° broad tail seen — probably longer, but the comet was observed through dust on horizon; a second, half-degree tail was observed to the east at ~ 50° difference in p.a.; I am struck by the complete change in the comet's appearance since yesterday and the increased brightness: no bright nuclear cond. (in contrast to yesterday)" [KID]. Apr. 21.94: in 20.3-cm *f*/10 T (50×), coma dia. 2′.5, DC = 7 [BRE02]. Apr. 22.38: "starlike central cond." [ROB03]. Apr. 23.35: in 31.7-cm L, "bright ray in tail" [BOR]. Apr. 24.36: "tail very faint" [BOR]. Apr. 24.36: in 20-cm *f*/10 T (78×), comet appears as "a bright condensed greenish circular glow ~ 7′ in dia., DC = 5, w/ a faint outer hood tapering into a diffuse tail trailing out of the 0°.64 degree field [CHE]. Apr. 27.108: 6-min exp. with Zeiss Sonnar 180-mm *f*/2.8 lens on TP 6415 emulsion shows coma dia. 4′.8, "straight narrow plasma tail" 3°.7 long in p.a. 310° [MIK]. Apr. 27.20: "broad, diffuse fan tail 1°.4 long spanning p.a. 270°-360°, diffuse edige of fan at p.a. 270° strongly curved northwards; 4° tail is a long, narrow spine near the outer edge of the fan, and thus ~ 45° E from the anti-solar direction; central cond. small, but not as prominent as on Apr. 20 and 21; overall aspect of coma more diffuse w/ gradual brightening toward center, contrasting w/ the appearance on the other dates, when the coma was uniform in brightness except for the center" [PER01]. Apr. 28.102: 6-min exp. with Zeiss Sonnar 180-mm *f*/2.8 lens on TP 6415 emulsion shows coma dia. 5′.0, "straight plasma tail 5°.7 long in p.a. 308°; both this and the Apr. 27.108 photos show complex plasma-tail structure w/ condensations, knots, kinks, etc., closely resembling the plasma-tail structure of comet 1989r" [MIK]. Apr. 28.49: "in 26-cm L, coma is round and distinctly blue; no stellar cond." [MOR]. Apr. 29.19: "tiny starlike nucleus of mag 7.0" [PER01]. Apr. 30.45: surface brightness of tail noticeably lower than during previous observations [HAL].

May 1.20: "stellar nucleus of mag ~ 11 visible in 51-cm L, but not in 20-cm L or binoculars" [KID]. May 2.08: in 20.4-cm *f*/6 L (72×), additional 0°.27 tail in p.a. 345°, curved from p.a. 350° to 331° [JAH]. May 3.08: in 20.4-cm *f*/6 L (72×), additional 0°.33 tail in p.a. 19°, m_2 ~ 12, dia. of central cond. ~ 5″ [JAH]. May 3.17: "tail seen as 15° opean beam w/ convex edges; the brightness across the coma looks more uniform again (see comments for Apr. 27.20), except for a nearly starlike center of mag ~ 6.5" [PER01]. May 4.06: in 15.6-cm L (29×), "very faint dust fan visible N of gas tail, extending to p.a. ~ 345°, maybe 0°.3-0°.4 long" [BOU]. May 4.10: 0°.5 fan tail in p.a. 295°-360°; "coma considerably larger than on Apr. 30, starlike nucleus clearly visible" [MIK]. May 4.19: "veil 3°.2 long spanning p.a. 280°-310°; 0°.5 narrow fan in p.a. 25° [PER01]. May 4.43: surface brightness of tail quite low. The comet is visible to the naked eye (as a faint star) without difficulty [HAL]. May 4.96: in 12×40 B, 0°.58 tail in p.a. 298° [DAH]. May 5.08: in 20.4-cm *f*/6 L (72×), additional 0°.13 tail in p.a. 295° [JAH]. May 5.47: "tail has become extremely faint; a broad fan is suspected" [MOR]. May 6.05: in 5.0-cm *f*/10 R (56×), elliptical coma toward p.a. 0°; in 20.4-cm *f*/6 L (72×), additional 0°.27 and 0°.23 tails in p.a. 302° and 288°, and 0°.10 and 0°.13 'spikes' in p.a. 358° and 254° [JAH]. May 7.18: "veil 2° long spanning p.a. 280°-305°, the edges being brighter; 0°.3 narrow fan near p.a. 20°; teardrop-shaped coma w/ starlike nucleus of mag 7.5; in 15-cm *f*/4.25 L (26×), DC = 4-5, starlike nucleus of mag 8" [PER01]. May 8.08: tail spans p.a. 290°-305° [BAR]. May 10.08: fan tail spans p.a. 290°-275° [BAR]. May 12.44: bright moonlight. One or two tails suspected in 41 cm L, but could not be confirmed [HAL]. May 12.95: in 31.6-cm *f*/5 L (130×), coma dia. 4′, DC = 4 [MID01]. May 13.44: "using 26-cm L (45×), coma is slightly elongated toward the tail, and at 156× there is a nearly stellar cond." [MOR]. May 13.98: in 20.3-cm *f*/10 T (50×), coma dia. 6′.8, DC = 4 [GRA04]. May 19.25: "tail very faint, broad" [ROB03]. May 19.45: "in 20×80 B, the tail structure is complex: a broad fan extends from p.a. 235° to 345°, and a bright plume is centered on p.a. 280°; in 26-cm L, there is a diffuse central cond." [MOR]. May 20.06: coma could be at least as large as 24′ [PER01]. May 20.33: complex tail structure: broad fan between p.a. 260° and 5° with brighter plumes at p.a. 275° and 307° [MOR]. May 21.06: in 20.4-cm *f*/6 L (72×), additional tail ~ 0°.8 long in p.a. 130° [JAH]. May 21.16: "tiny starlike nucleus of mag ~ 8" [PER01]. May 21.40: a very faint, broad tail, 45' long in pa 300, was suspected; this was part of a fan which extended from pa 300 to pa 260. Whether or not this a real feature could not be verified. The comet was faintly visible to the naked eye [HAL]. May 24.00: in 20.4-cm *f*/6 L (72×), m_2 ~ 12 [JAH]. May 24.08: "narrow, faint, straight tail" [KID]. *(Continued...)*

(Cont. from page 76) May 25.02: in 20.4-cm $f/6$ L (72×), $m_2 \sim 12.5$ [JAH]. May 25.15: in 10×70 B, coma dia. 48′, faint 0°.7 tail in p.a. 230° [DEA]. May 26.29: broad fan between p.a. 280° and 320°, brightest at edges; additional fan structure suspected to extend to p.a. 15° [MOR]. May 27.29: broad fan between p.a. 280° and 10°, brightest toward p.a. 310°; faint anti-tail toward p.a. ~ 125° wrapping around to p.a. 10° [MOR]. May 28.99: in 20.4-cm $f/6$ L (72×), $m_2 \sim 12$ [JAH]. May 29.99: in 20.4-cm $f/6$ L (72×), $m_2 \sim 12.5$ [JAH]. May 31.03: "faint, broad tail" [MIK]. May 31.30: "very diffuse dust tail, w/ very slight curve to N" [CHE].

June 2.40: "comet is somewhat similar to M23 in size and brightness; in 10×50 B, tail no longer appears fan-shaped; tail length may have been as long as 6°; in 20×80 B, a faint anti-tail between p.a. 40° and 110° is noted; in 26-cm L (156×), there is a faint stellar cond." [MOR]. June 3.42: "comet much fainter"; in 10×50 B and 20×80 B, very faint anti-tail noted toward p.a. 130° [MOR].

◇ ◇ ◇

Key to observers with observations published in this issue, with 2-digit numbers between Observer Code and Observer's Name indicating source [05 = Comets Section, Assn. of Lunar and Planetary Observers; 16 = Yamaneko Group of Comet Observers (c/o Akimasa Nakamura, Aichi, Japan); 17 = Kiev Komet. Tsirk.; 21 = Comet Section, Swedish League of Amateur Astronomers, c/o J. Danielsson; 24 = Norwegian Astronomical Society (c/o B. H. Granslo); etc.]. Those with asterisks (*) preceding the 5-character code are new additions to the Observer Key:

CODE	S	OBSERVER, LOCATION
*AAR	24	Knut B. Aarseth, Norway
AMO		Mauro Amoretti, Italy
*ANB	24	Birger Andresen, Norway
ANO	24	Odd Ivar Andersen, Norway
BAR		Sandro Baroni, Italy
BAR04		Antonella Bartolini, Italy
BOA		Andrea Boattini, Italy
BOR		John E. Bortle, NY, U.S.A.
BOU		Reinder J. Bouma, The Netherlands
*BRE02	24	Per-Jonny Bremseth, Norway
CAM		J. da S. Campos, South Africa
CAM03	14	Paul Camilleri, Australia
CHE		G. R. Chester, VA, U.S.A.
COL02		Mike J. Collins, England
DAH	24	Haakon Dahle, Norway
DAN01	21	Jorgen Danielsson, Sweden
DEA		V. F. de Assis Neto, Brazil
DEL	05	Kenneth J. Delano, MA, U.S.A.
EKL	21	Anders Ekloef, Sweden
*FRA		Evena Franciosini, Italy
GAR01		Gordon Garradd, N.S.W., Australia
GAR02		Stephane Garro, France
*GON03		Victor Gonzalez, Canary Is.
GRA04	24	Bjoern Haakon Granslo, Norway
GRE		Daniel W. E. Green, U.S.A.
HAL		Alan Hale, U.S.A.
*HEE	24	Lars Trygve Heen, Norway
*HER02		Carl Hergenrother, NJ, U.S.A.
HIR02		Satoshi Hirai, Japan
ISH02	16	Akiyoshi Ishikawa, Japan
JAH		Jost Jahn, West Germany
KAN		Kiyotaka Kanai, Japan
*KAR02	21	Timo Karbola, Sweden
KID		Mark Kidger, Canary Islands
KOB01		Juro Kobayashi, Japan
KOR		Stefan Korth, West Germany
KOR01		Valeriy L. Korneyev, Zelenograd, U.S.S.

CODE	S	OBSERVER, LOCATION
LOO01		Frans R. van Loo, Belgium
LUE		Hartwig Luethen, West Germany
*LUN02	24	Runar Lunde, Norway
MAC		Donald E. Machholz, CA, U.S.A.
MAR02		Jose Carvajal Martinez, Spain
MCC03	05	Michael McCants, TX, U.S.A.
MEI01		David D. Meisel, NY, U.S.A.
MID01	24	Oernulf Midtskogen, Norway
MIK		Herman Mikuz, Yugoslavia
MIL	05	Dennis Milon, MA, U.S.A.
MIL03	05	Martin P. Miller, CA, U.S.A.
MIN	05	R. B. Minton, AZ, U.S.A.
MIT	16	Shigeo Mitsuma, Japan
MOE		Michael Moeller, West Germany
MOR		Charles S. Morris, U.S.A.
MOR03		Warren C. Morrison, Canada
NAK01	16	Akimasa Nakamura, Japan
NOW		Gary T. Nowak, VT, U.S.A.
OHT	16	Tadao Ohtsuka, Japan
PEA	14	Andrew R. Pearce, Australia
PER01		Alfredo Jose Serra Pereira, Portugal
PRY		Jim Pryal, WA, U.S.A.
RIP		Jose Ripero, Spain
ROB03		Paul C. Robinson, WV, U.S.A.
SEA	14	David A. J. Seargent, Australia
SHE01		Yaron Sheffer, Israel
SIM	05	Karl Simmons, FL, U.S.A.
SKJ	24	Olaf Skjaeraasen, Norway
SPR		C. E. Spratt, BC, Canada
THE		Serge Thebault, France
*VER04		Danielle Verde, Canary Is.
VES	21	Christian Vestergaard, Sweden
WAR01	21	Johan Warell, Sweden
WAT01		Nobuo Watanabe, Japan
WES02		Margareta Westlund, Sweden
YDE	21	Mats Yderstig, Sweden

Comet Tago-Honda-Yamamoto 1968 IV

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1968 05 01.44		7.0	S	25.4	L			3	3			MCC03
1968 05 02.43		7.0		25.4	L			3	3			MCC03
1968 05 02.44		7.6	S	10.0	B		14					MIN
1968 05 08.47		7.8	S	15.2	L		52	2	3			MIL03
1968 05 12.43		7.7	AC	5.0	B		7	& 4	0			SIM
1968 05 13.48		7.8	AC	5.0	B		7	& 3	0			SIM
1968 05 16.09	O	7.5:	US	31.8	L			3	2			DEL
1968 05 16.12		9.4	S	25.4	L		50	3	4			MCC03
1968 05 19.12		9.5	S	25.4	L		50	3	3			MCC03
1968 05 22.14		9.0	AC	10.8	R		55	& 2	0			SIM
1968 05 23.15		9.5	AC	10.8	R		55	& 1.0	0			SIM
1968 05 24.15		9.0	AC	10.8	R			2	0			SIM
1968 05 26.14		9.2	AC	10.8	R		50	2	0			SIM
1968 05 27.14		9.0	AC	10.8	R			1.5	0			SIM
1968 05 28.14		9.2	AC	10.8	R			1.5	0			SIM
1968 05 29.14		9.4	AC	10.8	R		55	1.5	0			SIM
1968 05 30.14		9.1	AC	10.8	R			2	0			SIM
1968 05 31.15		9.4	AC	10.8	R			1.5	0			SIM
1968 06 01.15		9.5	AC	10.8	R			1	0			SIM

Comet Whitaker-Thomas 1968 V

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1968 06 19.15		10 :	S	25.4	L		50	&13.5	0/			MCC03
1968 06 21.10		9.9	AC	20.3	L		40	2.5	4			SIM
1968 06 21.10		9.9	AC	20.3	L		40	2.5	4			SIM
1968 06 21.16		10 :	S	15.2	L			5	0			MIL
1968 06 22.10		9.7	AC	20.3	L		40	2.5	4			SIM
1968 06 22.24		9.1	S	15.2	L		26	8	0			MIL03
1968 06 23.13		9.5	AC	20.3	L		40	& 3.5	4			SIM
1968 06 23.23		8.9	S	15.2	L		26	9	1			MIL03
1968 06 24.21		8.9	S	15.2	L		26	9	3			MIL03
1968 06 25.21		8.7	S	15.2	L		26	8	2			MIL03
1968 06 26.21		8.7	S	15.2	L		26	8	3			MIL03
1968 06 27.24		8.6	S	15.2	L		26	8	2			MIL03
1968 06 28.22		8.5	S	15.2	L		26	7	2			MIL03
1968 06 29.21		8.6	S	15.2	L		26	9	3			MIL03
1968 06 30.25		9.0	S	15.2	L		26	5	4			MIL03
1968 07 01.11		9.6	AC	20.3	L		40	1.5	5			SIM
1968 07 02.09		10.2	AC	20.3	L		40	1.5	3			SIM
1968 07 15.08		10.7	AC	20.3	L			1.5	4			SIM
1968 08 03.05		12.8	AC	20.3	L			0.8	0			SIM

Comet Machholz 1985 VIII

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1985 06 04.76	S	10.0	S	10	L	6	48	1.7	3			KAN
1985 06 05.75	S	9.8	S	13	L	6	44	& 2	3			ISH02
1985 06 06.57	S	9.7	S	13	L	6	44	1.5	3			ISH02

Comet Churyumov-Solodovnikov 1986 IX

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1986 08 10.57	S	12.7	AC	20	L	6	150	1.0				NAK01
1986 08 11.54	S	12.9	AC	20	L	6	106	1.4	4/			NAK01

Comet Terasako 1986 XVIII

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1987 01 28.39	M	7.9	AC	12.0	B		20	3.3				MIT
1987 01 31.40	S	7.6	AC	20	L	6	35	5.5	4			NAK01
1987 02 01.40	S	7.6	AC	20	L	6	35	6	4			NAK01
1987 02 15.41	S	8.5	AC	20	L	6	35	6.5	0			NAK01
1987 02 16.41	S	8.7	AC	20	L	6	35	6.5	0/			NAK01
1987 02 20.42	S	8.7	AC	20	L	6	58	5	0			NAK01
1987 03 01.42	S	9.8	AC	20	L	6	58	4	0			NAK01

Comet Sorrells 1987 II

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1986 11 07.79	S	11.1	AC	20	L	6	65	2	5			NAK01
1986 11 09.79	S	10.9	AC	20	L	6	65	2.5	5			NAK01
1986 11 22.44	S	10.3	AC	20	L	6	65	2.2	6			NAK01
1986 11 23.48	M	10.4	AC	15	L	6	51	0.9	6			WAT01
1986 11 26.50	S	10.0	AC	20	L	6	65	2.8	5			NAK01
1986 11 29.65	S	9.9	AC	20	L	6	65	2.5	5			NAK01
1986 11 30.40	S	10.2	AC	20	L	6	65	2.2	6			NAK01
1986 11 30.50	M	10.1	AC	16	L	6	40	2.1	5			MIT
1986 12 01.51	M	10.3	AC	16	L	6	31	2.2	5			MIT
1986 12 02.66	M	10.3	AC	15	L	6	51	0.8	4			WAT01
1986 12 06.43	S	9.7	AC	20	L	6	65	3.5	5			NAK01
1986 12 06.53	M	10.2	AC	16	L	6	31	2.2	4			MIT

Comet Sorrells 1987 II [cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1986 12 08.59	M	9.5	AC	15	L	6	51	1.3	4			WAT01
1986 12 08.60	S	9.8	AC	20	L	6	65	3	6	?	90	NAK01
1986 12 08.61	S	10.3	AC	13	L	6	62	2	3			ISH02
1986 12 09.62	M	10.1	AC	15	L	6	51	2.0	4			WAT01
1986 12 11.55	S	9.6	AC	15	L	6	51	1.7	5			WAT01
1986 12 19.53	S	10.3	AC	13	L	6	62	2	3			ISH02
1986 12 20.45	M	10.2	AC	16	L	6	31	2.5	4			MIT
1986 12 20.46	S	9.7	AC	13	L	6	62	3	3			ISH02
1986 12 22.45	S	9.6	AC	13	L	6	44	3	4			ISH02
1986 12 23.53	S	9.9	AC	13	L	6	62	2	4			ISH02
1986 12 24.48	S	9.7	AC	13	L	6	44	2.5	4			ISH02
1986 12 24.49	S	8.9	AC	20	L	6	35	6	6	?	70	NAK01
1986 12 26.41	S	9.3	AC	20	L	6	35	6.5	4/	?	80	NAK01
1986 12 26.49	S	9.6	AC	13	L	6	44	3	3			ISH02
1986 12 26.55	M	10.1	AC	16	L	6	31	3.3	4			MIT
1986 12 29.40	S	9.5	AC	20	L	6	35	4.5	5	?	60	NAK01
1986 12 29.41	S	9.6	AC	13	L	6	44	3	4			ISH02
1986 12 30.44	S	9.8	AC	13	L	6	62	2	3			ISH02
1986 12 31.48	M	10.4	AC	16	L	6	31	2.7	3			MIT
1986 12 31.56	S	9.6	AC	20	L	5	69	2.5	4			ISH02
1987 01 01.46	S	9.4	AC	13	L	6	44	3.5	3			ISH02
1987 01 01.50	M	9.2	AA	15	L	6	51	4.1	5			WAT01
1987 01 03.52	S	9.5	AC	20	L	5	69	2	2			ISH02
1987 01 04.42	M	10.2	AC	16	L	6	31	3.0	5			MIT
1987 01 04.43	S	9.3	AC	20	L	5	69	3	4			ISH02
1987 01 08.49	S	9.4	AC	20	L	5	69	3	3			ISH02
1987 01 11.40	S	9.8	AC	20	L	5	69	2	3			ISH02
1987 01 18.40	S	9.0:	AC	20	L	5	69	2	3			ISH02
1987 01 18.41	S	9.9	AC	20	L	6	65	4.5	4			NAK01
1987 01 20.41	S	9.3	AC	20	L	5	69	3	4			ISH02
1987 01 21.45	S	9.6	AC	13	L	6	44	2.5	4			ISH02
1987 01 24.41	M	10.3	AC	16	L	6	31	2.7	4			MIT
1987 01 24.42	S	9.9	AC	20	L	6	65	3.5	6			NAK01
1987 01 24.43	S	9.6	AC	20	L	5	69	3	3			ISH02
1987 01 25.41	S	9.6	AC	20	L	6	65	3.5	5	?	80	NAK01
1987 01 25.41	S	9.7	AC	20	L	5	69	2.5	3			ISH02
1987 01 26.42	S	9.8	AC	20	L	5	69	2.5	3			ISH02
1987 01 31.42	S	9.7	AC	20	L	6	65	3	4			NAK01
1987 02 01.42	S	9.5	AC	20	L	6	65	3.5	5			NAK01
1987 04 24.78	S	9.7	AC	20	L	6	65	3.5	4			NAK01
1987 04 29.76	S	9.7	AC	20	L	6	65	4	3			NAK01
1987 04 29.77	S	9.4	AC	13	L	6	62	3	2			ISH02
1987 05 03.75	S	9.6	AC	20	L	6	71	5	4			NAK01
1987 05 03.78	S	9.8	AC	13	L	6	62	2.5	3			ISH02
1987 05 04.74	S	9.7	AC	20	L	6	71	4.5	3			NAK01
1987 05 04.75	S	9.7	AC	15	L	6	51	3.8	2			WAT01
1987 05 05.77	S	9.6	AC	13	L	6	62	2.5	3			ISH02
1987 05 06.77	S	8.8	S	15	L	6	51	1.0	2			WAT01
1987 05 07.75	S	9.8	AC	20	L	6	65	3	3			NAK01
1987 05 09.75	S	9.5	AC	20	L	6	65	4	4			NAK01
1987 05 09.77	S	9.1	S	15	L	6	51	1.6	4			WAT01
1987 05 20.74	S	9.9	AC	13	L	6	62	2	3			ISH02
1987 05 24.73	S	9.7	AC	20	L	6	65	3.5	4			NAK01
1987 05 28.65	S	9.6	AC	20	L	6	65	4	3			NAK01
1987 05 30.74	M	9.5	AA	25	L	6	82	1.3	6			WAT01
1987 05 31.72	S	9.6	AC	20	L	6	65	3.5	4			NAK01
1987 06 06.73	S	9.3	AC	20	L	6	65	4.5	4			NAK01
1987 06 20.67	S	9.4	AC	20	L	6	65	4.5	4/			NAK01
1987 06 21.64	S	11.9	AC	25	L	6	82	0.5	2			WAT01

Comet Sorrells 1987 II [cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1987 06 21.65	S	9.7	AC	20	L	6	65	4	4			NAK01
1987 06 22.64	S	10.2	AC	13	L	6	62	2	2			ISH02
1987 06 27.65	S	10.0	AC	20	L	6	65	4	3			NAK01
1987 07 07.70	S	10.6	AC	20	L	6	65	3.5	3			NAK01
1987 07 22.67	S	10.9	AC	20	L	6	65	2.2	2/			NAK01
1987 07 23.63	S	10.8	AC	20	L	6	65	3	4			NAK01
1987 07 26.55	S	11.0	AC	20	L	6	65	2.8	5			NAK01
1987 08 01.58	S	11.1	AC	20	L	6	65	3.5	4/			NAK01
1987 08 15.57	S	12.1	AC	25	L	6	57	2.2	7			WAT01
1987 08 30.51	S	11.7	AC	25	L	6	57	1.2	3			WAT01

Comet Nishikawa-Takamizawa-Tago 1987 III

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1987 01 24.40	M	9.3	AC	16	L	6	31	3.9	2			MIT
1987 01 24.40	S	8.5	AC	20	L	6	35	6.5	2			NAK01
1987 01 24.41	S	8.6	A	13	L	6	44	5	3			ISH02
1987 01 25.39	S	8.4	A	13	L	6	24	6	3			ISH02
1987 01 25.39	S	8.4	AC	20	L	6	35	6.5	2/			NAK01
1987 01 26.40	S	8.4	A	13	L	6	24	6.3	3			ISH02
1987 01 27.42	S	8.3	A	13	L	6	24	5	2			ISH02
1987 01 28.40	M	9.4	AC	16	L	6	31	4	4			MIT
1987 01 28.42	S	8.2	A	13	L	6	24	4.5	3			ISH02
1987 01 29.42	S	8.6	A	13	L	6	44	3	3			ISH02
1987 01 30.41	S	8.5	A	13	L	6	44	3.5	2			ISH02
1987 01 31.41	S	8.0	AC	20	L	6	35	6	5			NAK01
1987 01 31.41	S	8.2	A	13	L	6	24	4	3			ISH02
1987 02 01.40	S	8.1	A	13	L	6	24	5	4			ISH02
1987 02 01.41	S	7.9	AC	20	L	6	35	5.5	4/			NAK01
1987 02 04.42	S	8.1	A	13	L	6	44	4	3			ISH02
1987 02 05.42	S	8.1	A	13	L	6	24	3.5	3			ISH02
1987 02 08.41	S	7.9	A	13	L	6	44	3	4			ISH02
1987 02 15.40	S	7.2	AC	20	L	6	35	5	6/			NAK01
1987 02 15.40	S	7.7	A	13	L	6	44	3	4			ISH02
1987 02 16.40	S	7.8	A	13	L	6	44	2	4			ISH02
1987 04 24.79	S	7.6	S	20	L	6	35	7	4/			NAK01
1987 04 29.77	S	7.1	AC	20	L	6	35	9	5			NAK01
1987 05 04.77	S	7.3	AC	20	L	6	35	7	3			NAK01
1987 05 07.77	S	7.8	S	20	L	6	46	5	2			NAK01
1987 05 09.76	S	7.5	S	20	L	6	46	6	3/			NAK01
1987 05 09.76	S	9.3	S	15	L	6	21	4.0	2			WAT01
1987 05 20.76	S	8.3	A	13	L	6	24	4	2			ISH02
1987 05 24.70	S	8.4	S	20	L	6	46	7	0			NAK01
1987 05 28.66	S	8.7	AA	20	L	6	58	5	0			NAK01

Comet Wilson 1987 VII

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1986 08 11.61	S	11.4	AC	20	L	6	106	1.8	7			NAK01
1986 08 12.65	S	11.6	AC	20	L	6	106	1.6	6			NAK01
1986 08 13.69	S	11.8	AC	13	L	6	64	0.5	4			ISH02
1986 08 25.59	S	11.3	AC	20	L	6	106	1.3	5			NAK01
1986 08 26.59	S	11.3	AC	20	L	6	106	1.5	6			NAK01
1986 08 28.60	S	11.5	AC	13	L	6	64	1	4			ISH02
1986 08 30.56	S	11.4	AC	20	L	6	65	1.6	7			NAK01
1986 09 01.63	S	11.4	AC	13	L	6	64	1	4			ISH02
1986 09 03.56	S	11.3	AC	13	L	6	64	1	5			ISH02
1986 09 03.60	S	11.2	AC	20	L	6	65	2.0	5/			NAK01
1986 09 04.54	S	11.1	AC	13	L	6	64	1	5			ISH02

Comet Wilson 1987 VII [cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1986 09 05.62	S	11.1	AC	20	L	6	65	1.7	6			NAK01
1986 09 11.52	S	10.9	AC	13	L	6	64	1.2	4			ISH02
1986 09 21.50	S	10.7	AC	15	L	6	101	1	2			WAT01
1986 09 22.64	S	11.0	AC	13	L	6	64	1	3			ISH02
1986 09 24.48	S	10.7	AC	20	L	6	65	2.0	4			NAK01
1986 09 27.46	S	11.5	AC	16	L	6	80	1	5			MIT
1986 09 27.51	S	10.9	AC	13	L	6	64	1.5	3			ISH02
1986 09 28.46	M	12.3	AC	15	L	6	101	0.5	2			WAT01
1986 09 29.56	S	11.4	AC	13	L	6	64	1.5	3			ISH02
1986 10 04.46	S	10.8	AC	20	L	6	65	1.6	5			NAK01
1986 10 05.51	M	11.1	AC	15	L	6	51	0.8	6			WAT01
1986 10 08.48	S	11.8	AC	13	L	6	88	1	3			ISH02
1986 10 22.43	S	11.0	AC	20	L	6	65	1.5	3/			NAK01
1986 10 22.45	S	11.5	AC	13	L	6	64	1	3			ISH02
1986 10 23.49	S	11.5	AC	16	L	6	80	& 1.5	5			MIT
1986 10 25.47	S	11.2	AC	20	L	6	106	1.4	3			NAK01
1986 10 25.52	M	10.8	AC	15	L	6	101	1.8	3			WAT01
1986 10 30.47	S	11.2	AC	20	L	6	65	1.7	5	0.03	80	NAK01
1986 10 30.48	S	11.3	AC	13	L	6	64	1.2	3			ISH02
1986 10 31.48	M	10.6	AC	15	L	6	51	2	2			WAT01
1986 11 02.47	M	10.9	AC	15	L	6	51	1.1	5			WAT01
1986 11 19.39	S	11.1	AC	20	L	6	106	1.4	4	0.04	50	NAK01
1986 11 22.39	S	11.2	AC	20	L	6	106	1.3	4/	?	60	NAK01
1986 11 29.39	S	10.8	AC	20	L	6	106	1.6	3			NAK01
1986 11 29.40	S	11.2	AC	13	L	6	62	1.2	3			ISH02
1986 11 30.38	S	10.8	AC	20	L	6	106	2.0	4	?	50	NAK01
1986 12 06.39	S	10.8	AC	20	L	6	106	1.4	3			NAK01
1986 12 26.38	S	11.0	AC	20	L	6	106	0.8	2			NAK01
1987 03 26.82	S	8.3:	AC	20	L	6	65	2				NAK01
1987 10 19.77	S	11.3	AC	20	L	6	106	1.6	6/			NAK01
1987 10 21.78	S	11.3	AC	20	L	6	106	1.4	6			NAK01
1987 10 27.76	S	11.4	AC	20	L	6	106	1.5	6			NAK01
1987 11 19.77	S	10.4	AC	20	L	6	65	4	3/			NAK01
1987 11 22.70	S	10.5	AC	20	L	6	65	3.5	4			NAK01
1987 11 24.71	S	10.5	AC	20	L	6	65	4.5	3/			NAK01
1987 12 13.59	S	10.7	AC	20	L	6	65	3.5	5			NAK01
1987 12 18.77	S	10.7	AC	20	L	6	65	3	5			NAK01
1987 12 19.67	S	10.6	AC	20	L	6	65	5	5/			NAK01
1987 12 21.59	S	10.6	AC	20	L	6	65	3.2	5/			NAK01
1987 12 24.80	S	10.7	AC	20	L	6	65	2.5	6			NAK01
1987 12 26.66	S	10.8	AC	20	L	6	65	2.6	5			NAK01
1987 12 27.75	S	10.8	AC	20	L	6	65	2.8	5			NAK01
1988 01 13.53	S	10.8	AC	20	L	6	106	1.8	4/			NAK01
1988 01 17.55	S	11.1	AC	20	L	6	106	1.8	4			NAK01
1988 01 23.56	S	11.5	AC	20	L	6	106	1.5	5/			NAK01
1988 01 24.48	S	11.6	AC	20	L	6	106	1.4	4/			NAK01
1988 02 07.48	S	12.1	AC	20	L	6	106	1.3	3/			NAK01
1988 02 21.48	S	13.3	AC	20	L	6	106	0.9				NAK01

Comet Levy 1987 XXI

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1987 10 18.40	S	8.9	AC	20	L	6	58	5	2			NAK01
1987 10 21.40	S	9.3	AC	20	L	6	58	4.5	2/			NAK01

Comet Rudenko 1987 XXIII

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1987 08 30.86	M	9.7	AC	20.3	T	10	80	2.3	3			GRA04

Comet Rudenko 1987 XXIII [cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1987 09 16.82	S	8.5	AC	20.3	T	10	80	2.5	4			DAH
1987 09 18.82	S	8.3	AC	20.3	T	10	80	3.0	3			DAH
1987 09 19.82	S	8.2	AC	20.3	T	10	80	3.0	4			DAH
1987 09 20.81	S	8.2	AC	20.3	T	10	80	3.0	4			DAH
1987 09 26.81	S	8.0	AC	20.3	T	10	80	3.5	5			DAH

Comet Bradfield 1987 XXIX

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1987 08 26.44	S	9.3	AA	16	L	6	31	4	3/			MIT
1987 09 24.89	M	7.4	SC	7.0	B		10	4.5				GRA04
1987 09 28.89	M	7.7	HD	20.3	T	10	80	4.0	5	0.20	105	GRA04
1987 10 03.41	M	7.4	S	12.0	B		20	2.9	6			MIT
1987 10 10.40	S	7.1	AA	12.0	B		20	3.3	5			MIT
1987 10 13.40	S	6.8	AA	12.0	B		20	3.2	6/			MIT
1987 10 17.75	S	7.0	AC	20.3	T	10	80	3	5			DAH
1987 10 19.40	M	6.3	AA	12.0	B		20	3.7	7	0.25		MIT
1987 10 25.40	M	6.4	AA	12.0	B		20	3.5	7			MIT
1987 10 27.39	B	6.4	AA	6.0	B		10					OHT
1987 11 01.73	M	6.1	SC	3.5	B		7		6			GRA04
1987 11 01.77	M	6.2	SC	20.3	T	10	80	3.0	6	0.17	90	GRA04
1987 11 05.42	M	5.9	AA	12.0	B		20	3	8	0.25		MIT
1987 11 06.72	S	5.5	AA	5.0	B		7	6	6	0.5	80	DAH
1987 11 08.36	B	6.2	AA	6.0	B		10					OHT
1987 11 08.40	M	5.8	AA	12.0	B		20	2.8	8	0.75		MIT
1987 11 08.73	S	5.5	AA	20.3	T	10	80	5	6/	0.20	75	DAH
1987 11 08.76	M	5.9	SC	3.5	B		7	& 3.0	5			GRA04
1987 11 08.76	M	6.0:	SC	20.3	T	10	80	2.6	6			GRA04
1987 11 10.38	M	5.8	AA	12.0	B		20	2.9	8	0.58		MIT
1987 11 10.74	S	5.4	AA	20.3	T	10	80	6	7	0.25	75	DAH
1987 11 11.36	B	5.9	AA	6.0	B		10					OHT
1987 11 11.39	M	5.9	AA	12.0	B		20	3.0	7			MIT
1987 11 14.40	M	5.9	AA	12.0	B		20					MIT
1987 11 17.38	M	6.1	AA	12.0	B		20	3.0	7	1.5		MIT
1987 11 17.74				6.0	R	11	35	3.3	7	&1.75		HEE
1987 11 17.75	S	5.4	AA	20.3	T	10	80	6	6/	0.42		DAH
1987 11 17.82	M	5.8	SC	20.3	T	10	80	5.0	6	0.23		GRA04
1987 11 20.39	M	5.8	AA	12.0	B		20	2.8	7	1.0		MIT
1987 11 21.36	B	5.9	AA	6.0	B		10					OHT
1987 11 21.38	M	6.0	AA	12.0	B		20	3.0	7/	1.0		MIT
1987 11 22.40	M	5.9	AA	12.0	B		20	3.2	7	1.5		MIT
1987 11 23.69	M	5.5	AA	3.5	B		7	& 5.0	5			GRA04
1987 11 24.40	M	5.9	AA	12.0	B		20	3.2	7	1.3		MIT
1987 11 25.42	M	5.8	AA	12.0	B		20	4	7			MIT
1987 11 26.71	S	5.4	AA	4.0	B		8	6.5	7	2.5		DAH
1987 11 28.71				6.0	R	11	35	2.5	7	0.5	50	HEE
1987 11 28.73	S	5.5	AA	20.3	T	10	80	7	6	0.33		DAH
1987 11 28.83	M	5.8	AA	4.0	R		10					GRA04
1987 11 29.42	M	5.9	AA	12.0	B		20	3.4	7	1.0		MIT
1987 11 29.71				6.0	R	11	35	2.5	7	0.5	60	HEE
1987 11 29.73	S	5.5	AA	20.3	T	10	80	6	6			DAH
1987 11 29.76	M	5.6	AA	3.5	B		7		6	2.4	75	GRA04
1987 12 01.74	S	5.5	AA	20.3	T	10	80	7	6	0.25	75	DAH
1987 12 02.69	M	5.8	SC	7.6	R	11	40	5.2	6			GRA04
1987 12 02.72				5.0	B		7	10	5/	0.5		DAH
1987 12 02.73	S	5.5	AA	20.3	T	10	80	7	6			DAH
1987 12 06.81	M	5.6	SC	3.5	B		7	5	6		70	GRA04
1987 12 07.74	S	5.9	AA	20.3	T	10	80	7	6	0.42		DAH
1987 12 08.41	M	6.1	AA	12.0	B		20	4.9				MIT

Comet Bradfield 1987 XXIX [cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1987 12 08.73				6.0	R	11	35		5	0.4	50	HEE
1987 12 10.82	M	5.4	SC	6.0	R	4	15	9.0	6	0.9	50	GRA04
1987 12 10.83	M	5.7	SC	20.3	T	10	80	6.5	7			GRA04
1987 12 14.41	M	6.4	AA	12.0	B		20	4.4	5/	1.0		MIT
1987 12 16.42	M	6.4	AA	12.0	B		20	4.7	6	1.2		MIT
1987 12 17.46	M	6.5	AA	12.0	B		20	4.7	6	1.0		MIT
1987 12 21.43	M	6.4	AA	12.0	B		20	5.0	5/	1.5		MIT
1987 12 25.38	M	6.6	AA	12.0	B		20	5.3	5/	1.0		MIT
1988 01 06.43	M	7.0	AA	12.0	B		20	5.5	5	0.67		MIT
1988 01 06.89	M	6.6	SC	20.3	L	6	49	3.7	3			GRA04
1988 01 08.48	M	7.3	AA	12.0	B		20	5.1	5	0.67		MIT
1988 01 13.41	M	7.5	S	12.0	B		20	6	5	0.42		MIT
1988 01 14.51	M	7.8	S	12.0	B		20	5.1	5			MIT
1988 01 18.41	M	7.7	S	12.0	B		20	4.7	4/	0.33		MIT
1988 01 23.43	M	7.9	S	12.0	B		20	4.5	4	0.25		MIT
1988 02 07.47	M	8.4	S	16	L	6	31	5	4			MIT
1988 02 16.48	S	9.4	S	16	L	6	31	5	3			MIT
1988 02 21.50	S	10.0	AC	16	L	6	31	3	3			MIT

Comet Levy 1987 XXX

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1988 03 26.81	S	11.8	AC	20	L	6	106	1.5				NAK01

Comet McNaught 1987 XXXII

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1988 01 05.28	M	6.8	SC	20.3	L	6	75	2.7	5			GRA04
1988 01 06.27	M	6.8	SC	20.3	L	6	75	3.2	5			GRA04
1988 02 21.79	S	9.6	AC	20.3	T	10	80	1.5	3			DAH
1988 03 11.81	S	10.7	AC	20.3	T	10	80	1.0	2			DAH
1988 03 13.81	S	10.8	AC	20.3	T	10	80	0.8	3			DAH
1988 03 18.85	M	10.7	AC	20.3	T	10	80	1.2	5			GRA04

Comet Furuyama 1988 IV

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1987 11 27.95	M	10.7	SC	20.3	T	10	123	1.3	3			GRA04

Comet Liller 1988 V

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1988 01 17.40	S	10.3	AC	20	L	6	65	3.5	3			NAK01
1988 01 18.40	S	10.5	AC	13	L	6	62	2	2			ISH02
1988 01 23.42	S	9.9	AC	20	L	6	65	3.2	4			NAK01
1988 01 24.41	S	9.7	AC	20	L	6	65	3.5	3			NAK01
1988 01 28.40	S	9.8	AC	13	L	6	62	2.5	2			ISH02
1988 02 07.40	S	8.7	AC	20	L	6	58	3.5	5		70	NAK01
1988 02 07.41	S	9.1	AA	12.0	B		20	3				MIT
1988 02 08.41	S	9.3	AC	13	L	6	44	3	3			ISH02
1988 02 09.40	S	9.0	AC	13	L	6	44	3.5	3			ISH02
1988 02 10.41	S	9.0	AC	13	L	6	62	3	2			ISH02
1988 02 15.41	S	8.7	AC	13	L	6	44	3	3			ISH02
1988 02 16.41	S	8.5	AC	13	L	6	44	3	3			ISH02
1988 02 16.41	S	8.7	AA	12.0	B		20	3	3			MIT
1988 02 17.40	S	8.4	AC	13	L	6	44	3	3			ISH02
1988 02 19.41	S	8.4	AC	13	L	6	44	3	3			ISH02
1988 02 21.41	S	8.0	AC	20	L	6	58	4	5			NAK01
1988 02 22.40	S	8.4	AC	13	L	6	62	2.5	3			ISH02

Comet Liller 1988 V [cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1988 03 07.41	S	7.8	AC	13	L	6	62	2.5	3			ISH02
1988 03 11.77	S	7.5	AC	20.3	T	10	80	2.5	5			DAH
1988 03 12.41	S	7.6	S	20	L	6	46	3	7			NAK01
1988 03 13.79	M	7.6:	HD	7.6	R	13	40	2.6	5			GRA04
1988 03 13.79	S	7.1	AC	20.3	T	10	80	2.5	5			DAH
1988 03 18.81	S	6.8	AC	20.3	T	10	80	2.5	6	0.17	30	DAH
1988 04 03.85	M	6.7	AC	20.3	T	10	80	1.5	7			DAH
1988 04 06.43	S	6.2	S	20	L	6	46	3	7			NAK01
1988 04 08.86				20.3	T	10	80	3.9	6		0	GRA04
1988 04 08.86	M	5.5	SC	3.5	B		7		7	1.0	10	GRA04
1988 04 08.96	M	6.4:	AC	20.3	T	10	80	3.0	7/	0.25	345	DAH
1988 04 09.43	S	6.1	S	20	L	6	46	4	6/			NAK01
1988 04 09.85				20.3	T	10	80	3.0	7	0.25	350	DAH
1988 04 09.96				20.3	T	10	80	3.9	7	0.48	5	GRA04
1988 04 09.96	M	5.6	SC	3.5	B		7					GRA04
1988 04 10.43	S	6.0	S	20	L	6	46	3.5	7		350	NAK01
1988 04 10.93				20.3	T	10	80	3.5	7	0.35	350	GRA04
1988 04 10.93	M	5.6	SC	3.5	B		7					GRA04
1988 04 12.94				20.3	T	10	40	4.8	7	0.45	355	GRA04
1988 04 12.94	M	5.7	SC	3.5	B		7					GRA04
1988 04 13.78	M	6.1	S	20	L	6	46	4	7	0.5	350	NAK01
1988 04 13.86	S	5.5	AA	5.0	B		10	3.0	7	0.33	355	BRE02
1988 04 14.81	B	6.0	AA	7.0	B		16					OHT
1988 04 15.43	S	6.1	AA	7.0	B		10		6			ISH02
1988 04 15.43	S	6.2	AA	13	L	6	24	3	4	0.17		ISH02
1988 04 15.78	M	5.9	S	20	L	6	46	5	7	0.6	355	NAK01
1988 04 16.42	S	5.8	AA	7.0	B		10	4	6			ISH02
1988 04 16.43	S	6.0	AA	13	L	6	24	3	6	0.17		ISH02
1988 04 18.86	S	5.5	AA	20.3	T	10	111	3.5	7	0.25	355	BRE02
1988 04 18.90	S	5.5	AA	5.0	B		10		7	0.50	355	BRE02
1988 04 18.91	S	5.6	AC	5.0	B		7			0.70	355	DAH
1988 04 18.96				20.3	T	10	40	5.9	8	0.45	350	GRA04
1988 04 18.96	M	5.8	SC	3.5	B		7					GRA04
1988 04 19.45	S	6.0:	AA	7.0	B		10		4			ISH02
1988 04 22.86	S	5.5	AA	5.0	B		10		7	0.33	355	BRE02
1988 04 22.90				20.3	T	10	40	4.2	7/	0.33		DAH
1988 04 22.90	S	5.8	AC	5.0	B		7				355	DAH
1988 04 22.96				20.3	T	10	40	5.6	7	0.50	350	GRA04
1988 04 22.96	M	5.3	SC	3.5	B		7					GRA04
1988 04 23.76	M	5.9	S	20	L	6	46	4.5	6	0.6	350	NAK01
1988 04 23.89				20.3	T	10	40	5.6	7	0.50	355	GRA04
1988 04 23.89	M	5.5	SC	3.5	B		7					GRA04
1988 04 23.89	S	5.5	SC	5.0	B		7	5	8	0.33	350	DAH
1988 04 24.44	S	6.0	AA	7.0	B		10	3	5	0.13		ISH02
1988 04 24.75	M	6.0	S	20	L	6	46	5	6/	0.6	350	NAK01
1988 04 24.77	M	5.9	AA	7.0	B		16					OHT
1988 04 24.79	S	5.7	AA	7.0	B		10	4	6	0.17		ISH02
1988 04 24.90	S	5.5	SC	5.0	B		7		7	0.33	355	DAH
1988 04 25.02	M	5.7	SC	3.5	B		7					GRA04
1988 04 25.03				20.3	T	10	40	4.9	7	0.60	350	GRA04
1988 04 25.88	S	5.7	AC	5.0	B		7		7			DAH
1988 04 25.92	M	5.7	SC	3.5	B		7					GRA04
1988 04 26.44	S	6.0	AA	7.0	B		10		3			ISH02
1988 04 26.45	S	6.0	AA	13	L	6	24	2	4			ISH02
1988 04 26.88				20.3	T	10	80	4.5	7	0.42		DAH
1988 04 26.89	S	5.7	SC	5.0	B		7			0.8	355	DAH
1988 04 26.93				20.3	T	10	40	4.4	7	0.50	350	GRA04
1988 04 26.94	M	5.9	SC	3.5	B		7					GRA04
1988 04 27.99				20.3	T	10	80	4.2	6	0.35	355	GRA04

Comet Liller 1988 V [cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1988 04 27.99	S	5.7	SC	3.5	B		7					GRA04
1988 04 28.44	S	6.2	AA	7.0	B		10	3	4			ISH02
1988 04 28.87	S	5.8	SC	5.0	B		7		7			DAH
1988 04 29.00				20.3	T	10	80	4.4	6	&0.3	350	GRA04
1988 04 29.00	S	5.9	SC	3.5	B		7					GRA04
1988 05 02.44	S	6.1	AA	5.0	B		7	4	4			ISH02
1988 05 02.46	S	6.0	AA	13	L	6	24	4	5	0.17		ISH02
1988 05 03.92	S	6.0	AC	5.0	B		7		6			DAH
1988 05 05.45	M	6.4	S	20	L	6	46	5	6	0.3	0	NAK01
1988 05 05.73	M	6.2	AA	12.0	B		20	3.5	6	0.3		MIT
1988 05 06.95				20.3	T	10	80	6.2	6	0.5		DAH
1988 05 06.96	S	6.0	SC	5.0	B		7			0.75	0	DAH
1988 05 07.94	M	6.0	AC	5.0	B		7			0.5	0	DAH
1988 05 07.96				20.3	T	10	80	6.2	6/	0.5		DAH
1988 05 07.98				20.3	T	10	80	4.9	5	0.40	10	GRA04
1988 05 07.98	M	6.4	AC	3.5	B		7					GRA04
1988 05 08.49	M	6.6	AA	20	L	6	46	5.5	7	0.7	20	NAK01
1988 05 08.49	S	6.3	AA	13	L	6	24	4	5	0.17		ISH02
1988 05 08.52	M	6.3	AA	12.0	B		20	4	6	0.5		MIT
1988 05 12.50	M	6.5	AA	12.0	B		20	5	5	0.3		MIT
1988 05 12.53	S	6.4	AA	7.0	B		10	6	4	0.17		ISH02
1988 05 12.54	S	6.5	AA	13	L	6	24	6	4	0.33		ISH02
1988 05 12.96				20.3	T	10	80	5.9	6	0.17		DAH
1988 05 12.96	S	6.4	AC	5.0	B		7					DAH
1988 05 13.00	M	7.0	SC	20.3	T	10	80	4.6	6			GRA04
1988 05 13.50	B	6.5	AA	7.0	B		16					OHT
1988 05 13.59	M	6.6	S	20	L	6	46	5.5	6	0.6	35	NAK01
1988 05 13.61	S	6.6	AA	7.0	B		10	5	5	0.25		ISH02
1988 05 13.62	S	6.3	AA	13	L	6	24	6	5	0.33		ISH02
1988 05 13.96				20.3	T	10	80	4.9	6	0.25		DAH
1988 05 13.96	S	6.5	AC	5.0	B		7					DAH
1988 05 14.00	M	6.7	SC	20.3	T	10	80	3.6	5	&0.2	30	GRA04
1988 05 14.95	M	7.7	SC	20.3	T	10	80	3.9	5			GRA04
1988 05 14.98				20.3	T	10	80	4.5	5	0.33		DAH
1988 05 14.98	S	6.4	AC	5.0	B		7					DAH
1988 05 16.51	S	6.6	AA	7.0	B		10	4	4			ISH02
1988 05 16.52	B	6.5	AA	7.0	B		16					OHT
1988 05 16.52	S	6.7	AA	13	L	6	24	4	4	0.08		ISH02
1988 05 16.94	S	6.6	AC	5.0	B		7	5	5			DAH
1988 05 17.95	S	6.7	AC	5.0	B		7	5	5			DAH
1988 05 18.51	M	6.5	AA	12.0	B		20	5.5	5	0.9		MIT
1988 05 18.54	M	7.0	S	20	L	6	46	6	6	0.5	60	NAK01
1988 05 18.56	S	6.8	AA	7.0	B		10	4	4			ISH02
1988 05 18.59	S	6.8	AA	13	L	6	24	4	4	0.17		ISH02
1988 05 19.48	S	6.7	AA	7.0	B		10	4	3			ISH02
1988 05 19.48	S	6.9	AA	13	L	6	24	3	3			ISH02
1988 05 21.98	S	7.7	AC	20.3	T	10	80	3	5			DAH
1988 05 23.57	M	7.0	S	20	L	6	46	6.5	5		70	NAK01
1988 05 23.74	S	6.8	AA	7.0	B		10	6	4			ISH02
1988 05 23.75	S	6.9	AA	13	L	6	24	6	4	0.13		ISH02
1988 05 23.76	B	6.9	AA	7.0	B		16					OHT
1988 05 30.50	S	7.5	AA	13	L	6	24	4	3			ISH02
1988 06 04.50	B	6.8	AA	7.0	B		16					OHT
1988 06 04.52	S	7.6	S	20	L	6	46	6.5	4		90	NAK01
1988 06 04.53	M	8.1	AA	12.0	B		20	5.5	4	0.2		MIT
1988 06 04.57	S	7.7	AA	7.0	B		10	4	3			ISH02
1988 06 04.58	S	7.8	AA	13	L	6	24	5	3	0.12		ISH02
1988 06 04.99	S	7.8	SC	20.3	T	10	80	5.5	5			GRA04
1988 06 05.48	S	7.7	S	20	L	6	46	7.5	4/		90	NAK01

Comet Liller 1988 V [cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1988 06 05.49	S	7.7	AA	7.0	B		10	6	3			ISH02
1988 06 05.50	B	6.7	AA	7.0	B		16					OHT
1988 06 05.50	M	7.9	AA	12.0	B		20	5.5	5	0.25		MIT
1988 06 05.51	S	7.8	AA	13	L	6	24	6	3	0.08		ISH02
1988 06 07.49	S	8.0	AA	13	L	6	24	5	3			ISH02
1988 06 07.52	S	7.9	AA	7.0	B		10	5	3			ISH02
1988 06 09.96	S	8.0	AC	3.5	B		7	6				GRA04
1988 06 10.53	S	8.1	AC	20	L	6	46	6.5	5	0.33	80	NAK01
1988 06 10.97	M	8.0	AC	3.5	B		7	7				GRA04
1988 06 12.01	M	8.1	AC	3.5	B		7	7				GRA04
1988 06 13.52	S	8.2	AC	20	L	6	46	6.5	4			NAK01
1988 06 14.05	M	8.5:	AC	20.3	T	10	80	6.4	5	&0.15	70	GRA04
1988 06 15.02	M	8.5:	AC	20.3	T	10	50	6.1	5	0.16	70	GRA04
1988 06 16.03				20.3	T	10	50	7.1	5	0.29	55	GRA04
1988 06 16.03	S	8.4	AC	3.5	B		7					GRA04
1988 06 17.03	S	8.7	AC	3.5	B		7					GRA04
1988 06 19.51	S	8.3	AA	20	L	6	46	6	2			NAK01
1988 07 11.52	S	9.8	AA	13	L	6	44	2	2			ISH02

Comet Machholz 1988 XV

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1988 08 12.75	S	8.9	AC	20	L	6	46	4	2			NAK01
1988 08 12.76	S	9.7	AC	25	L	6	57	2.5	5			WAT01
1988 08 13.75	S	8.9	S	25	L	6	57	2.7	5			WAT01
1988 08 14.75	S	9.4	S	25	L	6	57	2.4	5			WAT01
1988 08 15.74	B	8.3	AC	8.0	B		11	6.2	5	0.20	310	WAT01
1988 08 15.76	S	7.9	S	25	L	6	57	3.2	6			WAT01
1988 08 18.79	S	7.2	AC	8.0	B		11	10.0	4			WAT01
1988 08 19.77	B	7.1	AC	8.0	B		11	7.6	4	0.28	270	WAT01
1988 08 19.78	S	7.8	S	25	L	6	57	4	7		270	WAT01
1988 08 20.75	B	7.1	AC	8.0	B		11	10.1	4		270	WAT01
1988 08 20.75	S	6.8	AC	20	L	6	46	7	4			NAK01
1988 08 21.76	S	7.1	AC	8.0	B		11	12.7	4		270	WAT01

Comet Yanaka 1988 XX

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1989 01 04.78	S	11.2	AC	12.0	B		20	2.4	2			KAN
1989 01 04.79	S	10.6	AA	16	L	6	42	3	2			OHT
1989 01 04.82	S	10.5	NP	20	L	6	58	3.5	3			NAK01
1989 01 05.83	S	10.7	AC	20	L	6	58	4.5	2			NAK01
1989 01 12.83	S	10.8	AC	20	L	6	58	3.5	3			NAK01
1989 01 16.8	S	11.0	AC	20	T	10	50		0/			OHT
1989 01 17.82	S	10.9	AC	20	L	6	58	4	2			NAK01

Comet Yanaka 1988 XXIV

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1989 01 02.84	S	9.9	AA	20	T	10	50	& 2.5	4			OHT
1989 01 02.86	S	9.5	AC	12.0	B		20	3.7	3			KAN
1989 01 03.84	S	8.8	AC	20	L	6	58	3	5			NAK01
1989 01 03.84	S	9.9	AA	20	T	10	50	2	5			OHT
1989 01 04.84	S	8.8	AC	20	L	6	58	3.5	5/		310	NAK01
1989 01 04.84	S	10.0	AA	20	T	10	50	2.5	5			OHT
1989 01 04.85	S	9.9	AC	12.0	B		20	2.9	3	0.05	320	KAN
1989 01 05.84	S	8.9	AC	20	L	6	58	3	5		310	NAK01
1989 01 12.85	S	9.3	AC	20	L	6	58	3.5	4/			NAK01
1989 01 15.83	S	9.3	AC	20	L	6	58	4.5	4			NAK01

Comet Yanaka 1988 XXIV [cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1989 01 17.84	S	9.3	AC	20	L	6	58	4.5	4			NAK01

Comet Shoemaker-Holt-Rodriquez 1988h

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1988 09 09.46	S	13.4	AC	20	L	6	150	1.0	5/			NAK01
1990 04 16.14	I	[13.5		41	L	4	183					HAL

Comet Okazaki-Levy-Rudenko 1989r

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1989 08 28.87	S	11.0:	AC	20.3	T	10	62	2.5	2			GAR02
1989 08 29.85	S	10.4	CS	20.3	T	10	62	2	1	?	90	GAR02
1989 08 30.83	S	10.3	CS	20.3	T	10	62	3	2			GAR02
1989 09 03.19	S	9.4	S	12.5	R	7	64	5	2			MAC
1989 09 18.04	S	9.1	AC	15	R	5	31	4.5	2			MOR03
1989 09 20.05	S	9.0	AC	15	R	5	31	4.5	3			MOR03
1989 09 20.11	B	8.4	S	12.5	R	7	64	7	5			MAC
1989 09 21.02	S	8.8	AC	15	R	5	31	4.5	3			MOR03
1989 09 25.05	S	8.7	AC	15	R	5	31	4	3			MOR03
1989 09 25.78	B	8.6	CS	12.7	T	10	40	4	5			GAR02
1989 09 26.03	S	8.7	AC	15	R	5	31	4				MOR03
1989 09 27.04	S	8.7	AC	15	R	5	31	4.5	3			MOR03
1989 09 28.03	S	8.6	AC	15	R	5	31	4	3			MOR03
1989 09 28.80	B	8.2	CS	12.7	T	10	40	5	4	0.33		GAR02
1989 10 01.03	S	8.6	AC	15	R	5	31	4	4			MOR03
1989 10 01.81	S	7.9	AC	20.3	T	10	40	3	4/			DAH
1989 10 01.90	S	8.3	SC	5.0	R		8					MID01
1989 10 02.81	S	7.9	SC	20.3	T	10	80	3	4			DAH
1989 10 02.89	S	7.8	SC	7.6	R	16	48	4	4			GRA04
1989 10 02.90	S	8.1	SC	5.0	R		8					MID01
1989 10 03.81	S	7.7	AC	5.0	B		7	3				DAH
1989 10 03.81	S	8.1	SC	5.0	R		8					MID01
1989 10 03.90	M	7.9	SC	20.3	T	10	80	3.5	4			GRA04
1989 10 04.79	S	8.1	S	20.3	T	10	80	2.5	3			LUE
1989 10 04.80				31.6	L	5	130	3.5	7	0.2	30	MID01
1989 10 04.80	S	8.0	SC	5.0	R		8					MID01
1989 10 04.81	S	7.7	SC	20.3	T	10	80	4	4			DAH
1989 10 05.04	S	8.5	AC	15	R	5	31	4	3			MOR03
1989 10 05.83	S	7.6	AA	15	L	4	26	4	3/			PER01
1989 10 05.83	S	8.0	AA	3.4	B		9	5	1			PER01
1989 10 07.83	B	8.2	AA	15	L	4	26					PER01
1989 10 07.83	M	8.0	AA	15	L	4	26					PER01
1989 10 07.83	S	7.9	AA	15	L	4	26	2	8			PER01
1989 10 07.83	S	8.0	AA	3.4	B		9	& 3	6/			PER01
1989 10 08.83	M	7.9	AA	15	L	4	26					PER01
1989 10 08.83	S	7.8	AA	15	L	4	26	2.5	7			PER01
1989 10 09.79	S	7.5	AC	20.3	T	10	80	4	4			DAH
1989 10 09.82				31.6	L	5	130	3.5	7	0.15	10	MID01
1989 10 09.82	S	7.9	SC	5.0	R		8					MID01
1989 10 10.00	S	8.1	AC	15	R	5	31	3.5	4			MOR03
1989 10 11.77				31.6	L	5	130	3	7	0.07	10	MID01
1989 10 11.77	S	7.9	SC	5.0	R		8					MID01
1989 10 11.81	S	7.7	SC	20.3	T	10	80	3	4			DAH
1989 10 13.02	S	8.0	AC	15	R	5	31	3	4			MOR03
1989 10 13.83	S	7.2	SC	20.3	T	10	80	3	4			DAH
1989 10 15.76	S	7.1	AC	20.3	T	10	80	3.5	4/	&0.08	35	DAH
1989 10 17.77				31.6	L	5	130	3.5	7	0.13	30	MID01
1989 10 17.77	S	7.3	SC	5.0	R		8					MID01

Comet Okazaki-Levy-Rudenko 1989r [cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1989 10 21.78				31.6	L	5	130	4	8	0.2	20	MID01
1989 10 21.78	S	7.0	SC	5.0	R		8					MID01
1989 10 23.80	S	6.3	SC	7.6	R	16	48	3.5	5			GRA04
1989 10 23.81	S	6.0:	S	7.0	B		10	2	8			LUE
1989 10 24.98	S	7.4	AC	15	R	5	31	2.5	4			MOR03
1989 10 26.76				7.6	R	13	40	4.9	5	0.20	7	GRA04
1989 10 26.76	S	6.5	SC	4.0	R		10					GRA04
1989 10 28.19	S	6.5	AC	5.0	B		10	5	6	1.5	0	BOU
1989 11 02.19	M	6.2	AC	5.0	B		10	& 7	6			BOU
1989 11 07.71	S	6.3	SC	7.6	R	13	40	2.2	5			GRA04
1989 11 10.19	S	6.0	AA	5.0	B		10		5/			BOU
1989 11 10.44	S	6.4	AC	3.5	B		7	7				MOR03
1989 11 11.18	B	5.8	S	5.0	B		10	2.5	8	1.5	320	LUE
1989 11 11.18	S	5.8	S	9.0	M	6	25	2	8	1.5	320	LUE
1989 11 11.19	M	5.9	AA	5.0	B		10		7	1.5	331	BOU
1989 11 12.21	M	5.8	AA	5.0	B		10		7			BOU
1989 11 13.13	S	5.9	SC	20.3	T	10	80	3.7	7	0.20	345	GRA04
1989 11 16.19	S	5.8	SC	5.0	B		7					DAH
1989 11 16.20				20.3	T	10	80	2.7	5	0.17	330	DAH
1989 11 17.20	S	5.9	AA	5.0	B		10		6/			BOU
1989 11 18.19	S	6.0	S	5.0	B		10	& 2	5			LUE
1989 11 18.20	S	5.9	AA	5.0	B		10		6	1.3	330	BOU
1989 11 19.44	S	6.3	AC	3.5	B		7	5.5				MOR03
1989 11 20.21	S	5.8	AA	5.0	B		10		7			BOU
1989 11 22.25	S	5.9	SC	5.0	R		8					MID01
1989 11 22.45	S	5.9	AC	3.5	B		7	6.5				MOR03
1989 11 23.45	S	6.0	AC	3.5	B		7	9				MOR03
1989 11 24.22				31.6	L	5	130		7	0.4	320	MID01
1989 11 24.22	M	5.8	SC	20.3	T	10	50	5.2	7	0.43	315	GRA04
1989 11 24.22	S	5.6	SC	5.0	R		8					MID01
1989 11 25.21	M	5.5	AA	5.0	B		10	& 8	5/	&1		BOU
1989 11 27.25				31.6	L	5	130	2	8	0.42	70	MID01
1989 11 27.25	S	5.7	SC	20.3	T	10	80	4	6			GRA04
1989 11 27.25	S	5.9	SC	5.0	R							MID01
1989 11 28.25	S	5.9	SC	20.3	T	10	50	4.5	6			GRA04
1989 11 29.44	S	5.9	AA	3.5	B		7	7				MOR03

Comet Helin-Roman-Alu 1989v

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1989 10 21.42	S	11.6:	GA	25.4	L	4	114		2			SEA
1989 10 21.80	S	12.5:	AC	31.6	L	5	130	1.3	4			MID01
1989 10 23.88	S	12.4:	AC	31.6	L	5	130	0.9	5			MID01
1989 10 25.00	S	12.7	AC	44.5	L	4	80	1.6	0			MOR03
1989 10 25.84	S	10.5	AC	20.3	T	10	80	4	1			GRA04
1989 10 26.91	S	10.8	AC	20.3	T	10	80	3	2			GRA04
1989 10 27.45	S	11.1	GA	25.4	L	4	71	4	2			SEA
1989 10 28.88	S	10.3	AC	15.6	L	5	29	& 5	0/			BOU
1989 10 31.43	S	10.6	GA	25.4	L	4	71	5	2			SEA
1989 11 03.86	S	9.9	AC	25.4	J	6	48	& 5	1			BOU
1989 11 17.79	M	9.3	AC	25.4	J	6	48	& 5	2			BOU
1989 11 18.78	M	9.0	AC	25.4	J	6	48	& 6	3			BOU
1989 11 19.75	M	9.2	AC	25.4	J	6	48	& 5	2/			BOU
1989 11 20.78	S	9.4	AC	25.4	J	6	48	& 6	1/			BOU
1989 11 22.02	S	10.8	AC	44.5	L	4	80	2.0	2			MOR03
1989 11 22.73	S	9.9	AC	20.3	T	10	80	3	3			DAH
1989 11 22.75	S	9.3	AC	25.4	J	6	48	& 6	2			BOU
1989 11 22.90	S	10.0	AC	20.3	T	10	80	3.5	2			GRA04
1989 11 22.98	S	10.4	AC	15	R	5	62	3.0	1			MOR03

Comet Helin-Roman-Alu 1989v [cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1989 11 30.83	S	9.8	AC	25.4	J	6	48	5	1/			BOU
1989 12 04.75	S	10.2	AC	20.3	T	10	80	2.5	3			DAH
1989 12 21.77	S	10.4:	AC	25.4	J	6	48	& 4.5	0/			BOU
1989 12 23.06	S	11.5:	AC	44.5	L	4	80	2.4	0			MOR03
1989 12 23.72	S	10.4	AC	15.2	L	8	49	2.5	3			GRA04
1990 01 18.76	S	10.5:	AC	25.4	J	6	59	& 3	1/			BOU
1990 01 29.20	S	11.0:	AC	25.4	J	6	59	& 3	0/			BOU
1990 02 17.01	S	12.6:	AC	25.4	J	6	88	& 2	0			BOU
1990 02 22.16	S	12.7:	AC	25.4	J	6	88	2.0	0			BOU
1990 03 24.44	S[	13.0	NP	25.6	L	4	156					MOR

Comet Aarseth-Brewington 1989a1

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1989 11 16.73		8.5:		14.0	S	3	25	& 1.5				AAR
1989 11 17.70	S	8.2	AC	20.3	T	10	80	3	2/			DAH
1989 11 17.73	S	9.1:	S	5.0	R		8					MID01
1989 11 17.74	M	8.3	AA	20.3	T	10	80	2.5	3/			LUN02
1989 11 18.21	S	8.8	AC	25.4	J	6	59	3.0	3			BOU
1989 11 18.76	M	8.2	AC	25.4	J	6	48	3.5	4			BOU
1989 11 19.73	M	8.3	AC	25.4	J	6	48	3.0	4			BOU
1989 11 20.74	S	8.3	AC	25.4	J	6	59	3.0	3			BOU
1989 11 21.69	M	8.0	AC	7.6	R	13	40	3.5	4			GRA04
1989 11 21.70				31.6	L	5	130	3	4	0.18	8	MID01
1989 11 21.74	S	8.3	S	20.3	T	10	77	2.9	5			SKJ
1989 11 22.71	S	8.3	AC	20.3	T	10	80	2.5	4	0.10	10	DAH
1989 11 22.73				31.6	L	5	130	5	6	0.23	15	MID01
1989 11 22.73	M	8.0	AC	25.4	J	6	48	3.5	4/			BOU
1989 11 22.73	S	8.7	S	5.0	R		8					MID01
1989 11 23.70				31.6	L	5	130	3.5	6	0.25	8	MID01
1989 11 23.70	S	8.3	S	5.0	R		8					MID01
1989 11 24.21	M	7.9	AC	20.3	T	10	50	3	4	0.11	12	GRA04
1989 11 24.74				31.6	L	5	130	3.5	7	0.22	12	MID01
1989 11 24.74	S	8.3	AC	5.0	B		7					DAH
1989 11 24.74	S	8.4	S	5.0	R		8					MID01
1989 11 24.79				20.3	T	10	80	2.5	5	0.17	20	DAH
1989 11 25.22	S	7.7	AC	25.4	J	6	48		3/			BOU
1989 11 25.75	S	8.2:	AC	20.3	T	10	80	3	4	0.17	15	DAH
1989 11 27.26	S	7.6	AC	20.3	T	10	80	3	4			GRA04
1989 11 27.69				31.6	L	5	130	4.5	7	0.33	7	MID01
1989 11 27.69	S	7.5	SC	5.0	R		8					MID01
1989 11 28.24	S	7.8	AC	20.3	T	10	50	3.1	5			GRA04
1989 11 29.21	M	7.5	AC	25.4	J	6	48	3.0	5			BOU
1989 11 29.22	S	7.6	AC	5.0	B		10		5			BOU
1989 11 29.73				31.6	L	5	130	3.5	7	0.3	5	MID01
1989 11 29.73	S	7.4	SC	5.0	R		8					MID01
1989 11 30.24				31.6	L	5	130	3.5	8	0.25	3	MID01
1989 11 30.24	S	7.1	SC	5.0	R		8					MID01
1989 12 01.24				31.6	L	5	130	3	8	0.27	5	MID01
1989 12 01.24	S	7.1	SC	5.0	R		8					MID01
1989 12 01.26	M	7.6	SC	20.3	T	10	50	2.5	5			GRA04
1989 12 02.23	M	7.1	AA	10.8	L	5	20	4	6			BOU
1989 12 02.71				31.6	L	5	130	3	7	0.30	19	MID01
1989 12 02.71	S	6.8	SC	5.0	R		8					MID01
1989 12 03.22				20.3	T	10	80	3.5	6	0.30	353	GRA04
1989 12 03.22	M	7.0	AA	10.8	L	5	20		6/			BOU
1989 12 03.22	S	7.1	SC	3.0	R		6					GRA04
1989 12 03.45	S	7.2	AC	6	R	15	36	4	4			MOR03
1989 12 04.68	S	5.6:	SC	20.3	T	10	80	2	5			DAH

Comet Aarseth-Brewington 1989a1 [cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1989 12 04.69				31.6	L	5	130	3	7	0.25	12	MID01
1989 12 04.69	S	6.4	SC	5.0	R		8					MID01
1989 12 06.67	S	5.8	SC	20.3	T	10	80	2	6	0.17	10	DAH
1989 12 07.18	S	5.6	SC	5.0	B		7	& 2	7	0.6	0	DAH
1989 12 07.23				31.6	L	5	130	3	8	0.5	355	MID01
1989 12 07.23	S	6.0	SC	5.0	R		8					MID01
1989 12 07.24				20.3	T	10	50	2.9	7	0.7		GRA04
1989 12 07.24	S	5.6	SC	20.3	T	10	80	2.5	7	0.42	0	DAH
1989 12 07.24	S	5.7	SC	6.0	R	4	15	2.5		1.0	347	GRA04
1989 12 07.46	S	6.5	AC	3.5	B		7					MOR03
1989 12 09.22				20.3	T	10	62	4	6	1.2	344	GAR02
1989 12 09.22	B	5.8	S	5.0	R		8					GAR02
1989 12 09.23				20.3	T	10	50	2.5	7	0.50	352	GRA04
1989 12 09.23	S	5.7	SC	3.0	R		6					GRA04
1989 12 10.19	B	6.0	S	9.0	M	6	25			0.6	350	LUE
1989 12 10.19	S	5.8	S	9.0	M	6	25	2	7	1.2	10	LUE
1989 12 10.20	S	5.7	S	5.0	B		10		9			LUE
1989 12 10.68	S	5.8	SC	6.0	R		22	6				DAH
1989 12 10.68	S	6.1	SC	7.6	R	13	40	1.9	6			GRA04
1989 12 11.23				20.3	T	10	80	2.3	7	0.2	345	DAH
1989 12 11.23	S	5.0	SC	5.0	B		7					DAH
1989 12 11.25				31.6	L	5	130	2	8	0.4	346	MID01
1989 12 11.25	S	5.7	SC	5.0	R		8					MID01
1989 12 12.25				20.3	T	10	50	2.0	7	0.42	334	GRA04
1989 12 12.25	S	5.6	SC	6.0	R	4	10					GRA04
1989 12 13.25				20.3	T	10	50	3.5	7	0.43	342	GRA04
1989 12 13.25				31.6	L	5	130	2	8	0.4	348	MID01
1989 12 13.25	S	4.3	SC	5.0	R		8					MID01
1989 12 13.25	S	4.4	SC	3.0	R		6					GRA04
1989 12 13.46	S	4.7	AA	3.5	B		7					MOR03
1989 12 14.46	S	5.4	AA	3.5	B		7					MOR03
1989 12 18.25	M	4.0	AA	5.0	B		10		8	4.5	323	BOU
1989 12 18.46	S	4.3	AA	3.5	B		7					MOR03
1989 12 20.26				31.6	L	5	130	1.5	7	0.5	314	MID01
1989 12 20.26	S	4.3	SC	5.0	B		7		8	0.95	305	DAH
1989 12 20.47	S	3.9	AA	3.5	B		7					MOR03
1989 12 22.48	S	3.5:	AA	3.5	B		7					MOR03

Comet Austin 1989c1

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1989 12 22.53	S	10.5		20	L	5	71	2	6			GAR01
1989 12 23.47	S	10.3		20	L	9	74	2	6			GAR01
1989 12 26.56	S	9.6	A	5.0	B		10	4	5			GAR01
1989 12 28.48				20	L	5	71	3	5	0.03	80	GAR01
1989 12 28.48	S	9.6	A	5.0	B		10	4	4			GAR01
1990 01 14.45	S	8.8	A	5.0	B		10	3	5			GAR01
1990 01 16.45	S	8.9	A	5.0	B		10	4	5			GAR01
1990 01 17.48	S	8.6	A	5.0	B		10	5	5			GAR01
1990 01 22.52	S	8.6	A	5.0	B		10	4	4			GAR01
1990 01 23.44	S	8.6	A	5.0	B		10	4	4			GAR01
1990 01 24.46	S	8.6	A	5.0	B		10	5				GAR01
1990 01 27.46	S	8.5	A	5.0	B		10	5				GAR01
1990 01 28.48	S	7.1	LM	20	L	7	35	20	8	0.33	290	CAM03
1990 01 28.49	S	7.0	LM	8.0	B		20	25	8	0.08	290	CAM03
1990 02 07.75	S	7.4:	SC	8.0	B		20					FRA
1990 02 14.44	S	7.6	A	5.0	B		10	4				GAR01
1990 02 14.49	S	7.0	LM	8.0	B		20	15	8	0.08	290	CAM03
1990 02 15.44	S	7.6	A	5.0	B		10	4	5			GAR01

Comet Austin 1989c1 [cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1990 02 17.47	S	6.9	LM	8.0	B		20	15	8	0.33	250	CAM03
1990 02 17.47	S	6.9	LM	20	L	7	35	15	8	0.25	270	CAM03
1990 02 19.99	S[	7.5	HR	12.0	B		20					BOR
1990 02 20.47	S	7.0	LM	8.0	B		20	15	8	0.25	250	CAM03
1990 02 20.99	S	7.8	HR	12.0	B		20	1.5				BOR
1990 02 24.48	S	6.8	LM	8.0	B		20	8	8	0.25	260	CAM03
1990 02 24.48	S	6.8	LM	20	L	7	35	6	8	0.16	260	CAM03
1990 03 03.49	S	6.7	LM	8.0	B		20	4	8			CAM03
1990 03 08.00	S[	6.5	HR	12.0	B		20					BOR
1990 03 15.42	S	6.0	V	8.0	B		20	4	8	1.0	260	CAM03
1990 03 17.41	S	5.9	V	8.0	B		20	4	8	1.0	265	CAM03
1990 03 18.80	S	6.0:	AA	8.0	B		15	& 1				KOR
1990 03 21.08	B	5.3	AA	5.0	B		10	&20	4	0.75	90	ROB03
1990 03 22.01	S	6.0	HR	8.0	B		15	1.5	7/			BOR
1990 03 24.01	S	6.1	HR	8.0	B		15	2.0	7			BOR
1990 03 24.14	M	5.8	AA	8.0	B		20		8			MOR
1990 03 26.01	S	5.9	HR	8.0	B		15		7/			BOR
1990 03 26.14	M	5.2:	AA	8.0	B		20		8/			MOR
1990 03 27.01	S	5.6	HR	8.0	B		15	1.8	7/			BOR
1990 03 27.80	I	5.0:	SC	33.5	L	4	100	&10	3			MAR02
1990 03 28.01	S	5.7	HR	8.0	B		15	1.5	7/			BOR
1990 03 28.10	M	5.8	SC	5.0	B		10					HAL
1990 03 31.15	M	5.2	AA	8.0	B		20		9			MOR
1990 04 01.15	M	4.8	AA	8.0	B		20		9	2.0		MOR
1990 04 02.10	M	5.5	SC	5.0	B		10					HAL
1990 04 04.10	M	5.0	SC	5.0	B		10			0.33	45	HAL
1990 04 04.81	S	4.7	AA	5.0	B		7	& 9	1			JAH
1990 04 04.82	S	4.8	AA	12.0	R	4	20	3.6	8			LOO01
1990 04 04.84	S	4.7:	SC	20.3	T	10	80	1.7	7	0.12	45	DAH
1990 04 05.81	S	4.5:	AA	5.0	R	10	13	& 5.0	3			JAH
1990 04 05.81	S	5.5:	AC	6.0	R	8	19	& 1.5	8			MOE
1990 04 05.82	! M	4.9:	AA	8.0	R		20		8			BOU
1990 04 05.83	S	5.5	AA	5.0	B		10					BRE02
1990 04 06.02	B	5.2	HR	8.0	B		15					BOR
1990 04 06.02	N	7.5:		31.7	L	6	55	1.3	8			BOR
1990 04 06.83	B	6.0	S	10.3	R	7	40	8	7			COL02
1990 04 06.83	S	5.5	SC	20.3	T	10	80	1.4	7	0.05	45	DAH
1990 04 06.84				7.6	R	13	40	1.7	7	&0.10	30	GRA04
1990 04 06.84	S	5.1	SC	3.5	B		7					GRA04
1990 04 06.85	S	5.6	SC	6.0	R		22	1.9	7			DAH
1990 04 07.08	B	5.1	SC	5.0	B		10	< 5	9	1.5	40	ROB03
1990 04 07.8	S	5.0	AA	7.0	B		20					ANB
1990 04 07.8	S	5.0	AA	20.3	T	10	80	& 3	9		20	BRE02
1990 04 07.83	S	5.0:	SP	8.0	B		12					WES02
1990 04 07.83	S	5.2	SC	20.3	T	10	80	1.4	7	&0.08	45	DAH
1990 04 07.84	S	5.2	SC	6.0	R		22	2.1	7			DAH
1990 04 08.02	S	5.0	HR	8.0	B		15	1.0	8			BOR
1990 04 08.81	S	5.0:	AC	6.0	R	8	19	& 1.5	8			MOE
1990 04 08.81	S	5.2	AA	10.0	B	4	14	2	8/			LOO01
1990 04 08.82	! M	4.7:	AA	8.0	R		20		8			BOU
1990 04 08.83	B	5.8	S	5.0	B		7	17	8	0.3	45	COL02
1990 04 09.02	S	5.3	HR	8.0	B		15	& 1	8/			BOR
1990 04 09.11	M	4.8:	SC	41	L	4	83					HAL
1990 04 09.82	! B	4.8	AA	15.6	L	5	29		8/			BOU
1990 04 09.82	! S	4.7	AA	8.0	R		20		8/			BOU
1990 04 09.82	S	5.2	AA	10.0	B	4	14	2	9			LOO01
1990 04 09.83	! M	4.6	AA	15.6	L	5	29			&0.5	30	BOU
1990 04 10.79	S	3.9	SC	8.0	B		20	3	7/	0.6	15	BOA
1990 04 10.79	S	4.0:	AC	8.0	B		20		8			BAR04

Comet Austin 1989c1 [cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1990 04 10.80	S	4.8	AA	8.0	B		15	1.5	8	1	20	MIK
1990 04 11.11	M	4.4:	SC	41	L	4	83					HAL
1990 04 11.79	S	3.8	AA	8.0	B	5	20	4	8	0.3	20	BAR
1990 04 11.82	S	4.8	AC	48.5	L	4	136	& 1.8	8	0.3	40	MOE
1990 04 11.85				31.6	L	5	130	2	8	0.6	10	MID01
1990 04 11.85	S	4.8	S	5.0	R		8					MID01
1990 04 12.02	S	5.6	HR	8.0	B		15	& 1	8/			BOR
1990 04 13.02	S	5.2	HR	8.0	B		15	& 1	8/			BOR
1990 04 13.08				20.3	T	10	80		7	&0.17	5	GRA04
1990 04 13.10	M	5.4	SC	20.3	T	10	80	& 1.2				GRA04
1990 04 13.79	S	3.7	SC	8.0	B		20	2	8/	0.8	6	BOA
1990 04 13.79	S	3.9	AC	8.0	B		20		8			BAR04
1990 04 13.88				20.3	T	10	80	3	8	0.4	5	BRE02
1990 04 13.88	S	5.5	AA	5.0	B		10					BRE02
1990 04 13.92	B	5.0	SC	3.5	B		7			&3.0	0	ANO
1990 04 13.92	M	5.0	SC	20.3	T	10	80	1.3	7	0.56	357	GRA04
1990 04 13.94	S	4.7	SC	3.5	B		7			1.7		GRA04
1990 04 14.15	B	4.7	S	5.0	B		7	5	7	0.3	353	COL02
1990 04 14.49	M	5 :	SC	41	L	4	83					HAL
1990 04 16.14	B	3.1	AC	35	T	6	113	7	7	0.4	57	AMO
1990 04 16.15	B	3.0	AC	8.0	B		10		8	0.4	57	AMO
1990 04 16.15	B	4.5	S	5.0	B		7	5	7	0.2	355	COL02
1990 04 16.86	S	4.7	SP	8.0	B		12					WES02
1990 04 17.13	S	4.0	SC	5.0	B		10	2.5	7/	1	350	BOA
1990 04 17.14	S	4.4	SC	20	L	5	37	3	7	0.8	350	BOA
1990 04 18.01	S	4.8	SC	3.5	B		7					GRA04
1990 04 18.02	N	8 :		15.2	L	8	49	2.2	6	0.31	353	GRA04
1990 04 18.07	S	4.9	AC	15.2	L	5	44	2.5	8	1.2	345	MOE
1990 04 18.12	S	4.8	AA	12.0	R	4	20	2	8	1.08	347	LOO01
1990 04 18.16	B	4.6	S	5.0	B		7		6	0.2	345	COL02
1990 04 18.37				8.0	B		15	2.3	8	0.7	0	BOR
1990 04 18.37	B	5.1	HR	5.0	B		10	3				BOR
1990 04 18.86	S	5.2	SP	8.0	B		12					WES02
1990 04 19.10				15.6	L	5	24	& 2.5	8	2.0	345	BOU
1990 04 19.10	M	4.5	AA	5.0	B		10		7/			BOU
1990 04 19.24	S	4.8	A	5.0	B		10		6			KID
1990 04 19.37				12.0	B		20	3.1	8	1.0	347	BOR
1990 04 19.37				31.7	L	6	55	2.0	7/			BOR
1990 04 19.37	B	5.0	HR	5.0	B		10		8			BOR
1990 04 19.38	B	4.4	Y	2.0	B		7					MEI01
1990 04 19.47	M	5.5	SC	5.0	B		10			0.67	348	HAL
1990 04 19.50	M	4.8	AA	5.0	B		10		9	2.0	347	MOR
1990 04 19.76	B	5.1	AA	6.0	B		15	7	3	&2	30	HIR02
1990 04 20.20	! S	4.6	AA	3.4	B		9	& 9	6/			PER01
1990 04 20.23	S	5.1	A	5.0	B		10	& 7	5	4		KID
1990 04 20.46	M	5.4	SC	5.0	B		10			1.5	352	HAL
1990 04 20.90	S	5.5	AA	5.0	B		10					BRE02
1990 04 21.12	S	5.2	A	5.0	B		10	2	8	0.3		LOO01
1990 04 21.21	! S	4.7	AA	3.4	B		9					PER01
1990 04 21.23	S	4.7	A	5.0	B		10		5	2		KID
1990 04 21.24	S	5.0	A	5.0	B		8					VER04
1990 04 21.24	S	5.3	A	5.0	B		10					GON03
1990 04 21.47	M	5.4	SC	5.0	B		10			2.0	338	HAL
1990 04 21.94	S	5.8	AA	5.0	B		10					BRE02
1990 04 22.22	S	4.8	A	5.0	B		10		6	2		KID
1990 04 22.23	S	4.9	A	5.0	B		10					GON03
1990 04 22.36				12.0	B		20	2.6	8	1.4	330	BOR
1990 04 22.36	B	5.3	HR	5.0	B		10	3.5	7/	0.75	330	BOR
1990 04 22.38	B	4.8	AA	5.0	B		10	& 5	8	2.0	330	ROB03

Comet Austin 1989c1 [cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1990 04 23.09	M	5.2	AA	10.8	L	5	20		7/			BOU
1990 04 23.35				31.7	L	6	55	3.1	7			BOR
1990 04 23.35	B	5.3	HR	5.0	B		10	3.5	7/	2.4	323	BOR
1990 04 23.36	B	5.2	AA	5.0	B		12		8/			GRE
1990 04 23.81	S	4.5	AA	7.0	B	5	10	7	6	7	320	KOB01
1990 04 23.98	S	4.7	SP	8.0	B		12					WES02
1990 04 24.09	M	5.1	AA	5.0	B		10		6/	2.5	323	BOU
1990 04 24.34	B	4.0	Y	5.0	B		7			3	310	MEI01
1990 04 24.36	B	4.8	S	6.3	B		9			&0.75	315	CHE
1990 04 24.36	B	5.3	HR	5.0	B		10	2.5	7/	3.0	319	BOR
1990 04 24.78	S	4.6	AA	7.0	B	5	10	7	6	5	315	KOB01
1990 04 25.00	S	4.7	SP	8.0	B		12					WES02
1990 04 25.08	S	5.7	SC	5.0	B		7	& 2.0	6			DAH
1990 04 25.12	B	5.4	A	10.0	B		14					LOO01
1990 04 25.12	S	5.0	A	10.0	B		14	3	7	0.5	326	LOO01
1990 04 25.47	M	5.1	AA	5.0	B		10		9	3.0	323	MOR
1990 04 25.49	M	5.1	AA	8.0	B		20	3	8			MOR
1990 04 25.95	S	4.7	SP	8.0	B		12					WES02
1990 04 25.96				31.6	L	5	130	3	7	0.5	290	MID01
1990 04 25.96	S	5.3	HD	5.0	R		8					MID01
1990 04 25.99				20.3	T	10	80	& 3.5	5	0.41	317	GRA04
1990 04 26.01	S	5.1	SC	6.0	R	4	10			0.7		GRA04
1990 04 26.08	B	5.2	AA	5.0	B		10					BOU
1990 04 26.08	M	5.0	AA	5.0	B		10	5	6/	2.0	320	BOU
1990 04 26.45	M	5.3	SC	5.0	B		10			1.5	315	HAL
1990 04 26.47	M	5.2	AA	5.0	B		10		8/	3.0	315	MOR
1990 04 27.03				31.6	L	5	130	4	8	0.7	305	MID01
1990 04 27.03	S	5.1	HD	5.0	R		8	6.5	8	1.0	310	MID01
1990 04 27.11	M	5.3	AA	8.0	B		15	6	7	2.2	310	MIK
1990 04 27.12	B	5.1	S	5.0	B		7	12	6	0.5	310	COL02
1990 04 27.12	S	4.4	AA	8.0	B	5	20	5	7	1.0	315	BAR
1990 04 27.20	S	4.9	AA	3.4	B		9	10	6	4	355	PER01
1990 04 27.92	S	5.1	SC	5.0	B		7	2.6	6	0.72	298	DAH
1990 04 28.00				20.3	T	10	80	4.8	5/	0.43	306	GRA04
1990 04 28.00	B	4.9	AC	5.0	B		7	5	6	1.5	310	MOE
1990 04 28.01	S	5.0	SC	3.5	B		7					GRA04
1990 04 28.02				31.6	L	5	13	5	8	0.5	305	MID01
1990 04 28.02	S	5.1	HD	5.0	R		8	6.5	7	0.5	305	MID01
1990 04 28.03	I	5.0	AC	0.0	E		1					MOE
1990 04 28.11	B	5.2	S	5.0	B		7	8	5	0.3	295	COL02
1990 04 28.11	M	5.3	AA	8.0	B		15	6.5	6/	1.0	313	MIK
1990 04 28.35	B	5.3	HR	5.0	B		10					BOR
1990 04 28.42	S	5.3	SC	5.0	B		7	&10	5			SHE01
1990 04 28.48	I	4.8	AA	0.7	E		1		9			MOR
1990 04 28.48	M	5.0	AA	5.0	B		10		8	2.5	311	MOR
1990 04 28.96	S	4.8	SP	8.0	B		12					WES02
1990 04 29.00				20	T	10	100	4	3	0.2	295	WES02
1990 04 29.10	B	5.3	S	5.0	B		7	12	5	0.4	295	COL02
1990 04 29.10	M	5.3	AA	8.0	B		15	7	7	2.2	318	MIK
1990 04 29.11	S	4.7	AC	8.0	B		20	5	6	1.2	310	BOA
1990 04 29.19	B	5.1	AA	3.4	B		9					PER01
1990 04 29.19	S	4.7	AA	3.4	B		9	7	3/	1.8	330	PER01
1990 04 29.20	S	5.3	A	5.0	B		10		5	1.5		KID
1990 04 29.47	M	5.1	AA	5.0	B		10					MOR
1990 04 30.08	S	5.0	AC	8.0	B		15	5	6	0.75	300	KOR
1990 04 30.09	S	4.8	A	5.0	B		10	6	6			LOO01
1990 04 30.10	M	5.3	AA	8.0	B		15	7	7	2.0	306	MIK
1990 04 30.11	B	5.3	S	5.0	B		7	10	4	0.2	295	COL02
1990 04 30.45	M	5.1	SC	5.0	B		10			1.0	300	HAL

Comet Austin 1989c1 [cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1990 04 30.47	M	5.1	AA	5.0	B		10		8	1.25	323	MOR
1990 04 30.97	S	5.1	SC	3.5	B.		7					GRA04
1990 04 30.98	B	5.1	AC	5.0	B		7	5	5	1.2	300	MOE
1990 04 30.98	S	5.0	HD	5.0	R		8	5	7			MID01
1990 05 01.00				20.3	T	10	50	4.4	5	0.38	302	GRA04
1990 05 01.00	S	5.3	SP	8.0	B		12					WES02
1990 05 01.08	S	4.7	AA	8.0	B		15	6	6/	1.2	290	KOR
1990 05 01.20	S	5.3	A	5.0	B		10			1.5		KID
1990 05 01.95				20	T	10	100	8	4	0.2	291	WES02
1990 05 01.96	B	5.1	AC	5.0	B		7	6	5			MOE
1990 05 01.96	S	5.2	SP	8.0	B		12					WES02
1990 05 01.97	S	5.1	SC	5.0	B		7					GRA04
1990 05 01.98				8.0	R	11	36	4.6	5	0.27	303	GRA04
1990 05 02.01	S	5.3	SC	20.3	T	10	80	4.9	6	0.25	295	DAH
1990 05 02.01	S	5.4	SC	5.0	B		7	3.1	6	0.54	293	DAH
1990 05 02.02				31.6	L	5	130	3.5	8	0.4	290	MID01
1990 05 02.02	S	4.9	HD	5.0	R		8	6.5	8	0.2	290	MID01
1990 05 02.06	B	5.3	AA	5.0	R	10	13	&13	7	2.4	293	JAH
1990 05 02.06	B	5.4	AA	5.0	B		10					BOU
1990 05 02.06	M	5.1	AA	5.0	B		10	7	6	3.5	298	BOU
1990 05 02.07				5.0	R	10	33	& 9	6	&1.2	293	JAH
1990 05 02.07	I	5.0	AA	0.7	E		1					BOU
1990 05 02.08				20.4	L	6	72	3.1	4	&0.8	300	JAH
1990 05 02.12	B	5.2	AA	5.0	B		7	15		1.5	312	THE
1990 05 02.95	S	5.3	SC	3.5	B		7					GRA04
1990 05 02.97				20.3	T	10	80	4.8	5	0.23	300	GRA04
1990 05 03.00				31.6	L	5	130	4.5	7	0.4	285	MID01
1990 05 03.00	S	4.9	HD	5.0	R		8	6.5	7	0.2	280	MID01
1990 05 03.05	M	5.0	AA	5.0	B		10	7.5	6	3.5	296	BOU
1990 05 03.06	B	5.7	AA	5.0	R	10	13					JAH
1990 05 03.06	I	5.0	AA	0.7	E		1					BOU
1990 05 03.06	S	5.9	AA	5.0	R	10	13	5.5	7	1.9	300	JAH
1990 05 03.07				5.0	R	10	33	4.8	6	&1.2	300	JAH
1990 05 03.07				5.0	R	10	125	3.2	4			JAH
1990 05 03.08				20.4	L	6	72	& 5.0	7	1.1	328	JAH
1990 05 03.08	S	4.9	AC	8.0	B		15	6	5	1.8	290	KOR
1990 05 03.17	S	4.6	AA	3.4	B		9	7	7	1.5	310	PER01
1990 05 03.98	B	4.9	AC	5.0	B		7	6	5			MOE
1990 05 04.00				20.3	T	10	50	6.2	5	0.28	296	GRA04
1990 05 04.01	S	5.1	SC	3.5	B		7					GRA04
1990 05 04.06	M	4.9	AA	5.0	B		10	9	5/	2.3	286	BOU
1990 05 04.08	I	4.9	AA	0.7	E		1					BOU
1990 05 04.09	S	5.0	A	5.0	B		10	4.5	6			LOO01
1990 05 04.10	B	5.2	A	5.0	B		10					LOO01
1990 05 04.10	M	5.7	AA	8.0	B		15	8.5	6	1.9	295	MIK
1990 05 04.10	S	5.6	AA	5.0	B		7					MIK
1990 05 04.19	B	5.2	AA	3.4	B		9					PER01
1990 05 04.19	M	5.0	AA	3.4	B		9					PER01
1990 05 04.19	S	4.9	AA	3.4	B		9	9	6/	3.2	295	PER01
1990 05 04.43	M	5.0	SC	5.0	B		10			1.0	298	HAL
1990 05 04.47	M	5.3	AA	5.0	B		10		7/			MOR
1990 05 04.94	S	5.2	SC	4.0	B		12	5.6	6			DAH
1990 05 04.97	B	5.1	AC	5.0	B		7	6	5			MOE
1990 05 04.99				31.6	L	5	130	3.5	8	0.3	280	MID01
1990 05 04.99	S	4.9	HD	5.0	R		8	5	7	0.2	280	MID01
1990 05 04.99	S	5.1	SC	3.5	B		7					GRA04
1990 05 05.00				20.3	T	10	80		5	0.3	297	DAH
1990 05 05.00				20.3	T	10	80	5.8	5	0.14	293	GRA04
1990 05 05.04	S	5.0	A	5.0	B		10		6			LOO01

Comet Austin 1989c1 [cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1990 05 05.05				5.0	R	10	56	3.6	4			JAH
1990 05 05.05	B	5.3	A	5.0	B		10					LOO01
1990 05 05.05	B	5.5	AA	5.0	R	10	13			&0.2	280	JAH
1990 05 05.05	M	4.9	AA	5.0	B		10	10	5/			BOU
1990 05 05.05	S	5.3	AA	5.0	R	10	13	3.7	6	0.47	295	JAH
1990 05 05.08				20.4	L	6	72	3.7	4	0.17	326	JAH
1990 05 05.09	M	5.6	AA	8.0	B		15	8	6	1.4	297	MIK
1990 05 05.18	B	5.2	AA	3.4	B		9					PER01
1990 05 05.18	M	5.1	AA	3.4	B		9					PER01
1990 05 05.18	S	4.9	AA	3.4	B		9	9	7	1.5	290	PER01
1990 05 05.47	M	5.4	AA	5.0	B		10	9.5	7	1.25	292	MOR
1990 05 05.73	B	5.4	AA	6.0	B		15	7	4	1.5	300	HIR02
1990 05 05.89	S	5.4	AA	8.0	B		20	6	7			PEA
1990 05 05.97	B	5.3	AC	5.0	B		7	5	5			MOE
1990 05 05.97	S	5.4	SC	3.5	B		7					GRA04
1990 05 05.98				31.6	L	5	130	4	7	0.3	275	MID01
1990 05 05.98	S	5.0	HD	5.0	R		8	4	6	0.2	280	MID01
1990 05 06.00				20.3	T	10	80	5.0	5	0.13	303	GRA04
1990 05 06.00	S	5.1	SC	5.0	B		7	& 5.0	5			DAH
1990 05 06.04	B	5.5	AA	5.0	R	10	13					JAH
1990 05 06.04	S	5.7	AA	5.0	R	10	13	5.0	7	0.37	290	JAH
1990 05 06.05				5.0	R	10	56	5.0	4	&0.2	290	JAH
1990 05 06.07				20.4	L	6	72	& 4.0	5	0.33	293	JAH
1990 05 06.08	B	4.9	AC	35	T	6	113	0.4	6	0.4	300	AMO
1990 05 06.11	B	4.9	AC	8.0	B		10	0.3	6	0.3	300	AMO
1990 05 06.18	S	5.0	AA	3.4	B		9		6/			PER01
1990 05 06.47	M	5.4	AA	5.0	B		10	9.5	7			MOR
1990 05 06.89	S	5.4	AA	8.0	B		20	6	7			PEA
1990 05 06.99	M	5.6	SC	20.3	T	10	80	4.8	4/			GRA04
1990 05 07.06	B	5.7	AA	5.0	R	10	13					JAH
1990 05 07.06	S	5.5	AA	5.0	R	10	13	4.8	5	0.37	292	JAH
1990 05 07.08				5.0	R	10	56	4.0	4			JAH
1990 05 07.09	S	4.9	AA	8.0	B	5	20	8	4			BAR
1990 05 07.09	S	5.0	AA	5.0	B		10	8.5	5			BOA
1990 05 07.09	S	5.1	AA	8.0	B		20	9	5	2.0	274	BOA
1990 05 07.10	M	5.6	AA	8.0	B		15	8	6	&1		MIK
1990 05 07.18	S	4.9	AA	3.4	B		9	&10	4	2	292	PER01
1990 05 08.08	S	5.0	AA	8.0	B	5	20	8	4	1.0	298	BAR
1990 05 09.18	S	4.9	AA	3.4	B		9	& 9	6/			PER01
1990 05 09.98	S	6.1	SC	20.3	T	10	80	5.2	4			GRA04
1990 05 10.06	S	5.5	AA	5.0	R	10	13	6.4	3			JAH
1990 05 10.08	S	5.0	AA	8.0	B	5	20	9	4	1.0	282	BAR
1990 05 10.16	S	5.1	AA	3.4	B		9	& 8	6/			PER01
1990 05 10.31	M	4.6	A	7.0	B		10					DEA
1990 05 11.00	S	5.1	SC	5.0	B		7	7				DAH
1990 05 11.08	S	4.9	A	5.0	B		10	7	5	0.5		LOO01
1990 05 11.15	S	4.9	AA	3.4	B		9	&10	6			PER01
1990 05 12.35	B	5.3	Y	5.0	B		7	15				MEI01
1990 05 12.38	M	5.6	AA	5.0	B		10	9	4			MOR
1990 05 12.44	M	5.4	SC	5.0	B		10					HAL
1990 05 12.95	S	4.5	HD	5.0	R		8					MID01
1990 05 13.01	S	5.5	SC	3.5	B		7					GRA04
1990 05 13.02	S	5.1	SC	5.0	B		7	7	5			DAH
1990 05 13.02	S	5.6	SC	20.3	T	10	80	5.6	4			GRA04
1990 05 13.43	M	5.3	AA	5.0	B		10	12.5	5	2.0	292	MOR
1990 05 13.99	S	5.3	SC	3.5	B		7	10				GRA04
1990 05 14.31	B	5.6	Y	5.0	B		7					MEI01
1990 05 14.44	M	5.2	AA	5.0	B		10	12.5	5	2.25	290	MOR
1990 05 15.00	N	9 :		31.6	L	5	130	4.5	5	0.2	280	MID01

Comet Austin 1989c1 [cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1990 05 15.00	S	4.7	HD	5.0	R		8	8	4			MID01
1990 05 15.32	S	4.6	A	7.0	B		10	12				DEA
1990 05 15.89	S	5.5	AA	8.0	B		20	7	6			PEA
1990 05 16.88	S	5.5	AA	8.0	B		20	6.5	6			PEA
1990 05 16.94	B	5.3	AC	5.0	B		7	10	4	0.5	270	MOE
1990 05 16.96	S	5.3	AC	15.2	L	5	44	12	4			MOE
1990 05 16.99	S	5.1	SC	5.0	B		7	8	4			DAH
1990 05 17.01	S	6.1	SC	20.3	T	10	80	5.5	3			GRA04
1990 05 17.09	S	5.3	A	5.0	B		10	9	4			LOO01
1990 05 17.89	S	5.4	AA	8.0	B		20	7.5	6	1.0	254	PEA
1990 05 18.05	B	5.3	A	5.0	B		10					LOO01
1990 05 18.35	B	5.5	AA	8.0	B		11	15	4			ROB03
1990 05 19.06	O	5.5	AA	33.5	L	4	100	20				RIP
1990 05 19.06	S	5.1	A	5.0	B		10	13	4			LOO01
1990 05 19.25	B	5.5	AA	8.0	B		11	12	5	1.0	260	ROB03
1990 05 19.33	S	4.5	A	7.0	B		10	23				DEA
1990 05 19.44				8.0	B		20			1.0	235	MOR
1990 05 19.44				8.0	B		20			1.0	345	MOR
1990 05 19.44				8.0	B		20			2.25	280	MOR
1990 05 19.44	M	5.2	AA	5.0	B		10	16	4	2.25	280	MOR
1990 05 19.89	S	5.3	AA	8.0	B		20	9	6	0.5	249	PEA
1990 05 19.96	S	5.4	AC	15.2	L	5	44	12	3			MOE
1990 05 20.06	S	4.9	AA	3.4	B		9	&16	1			PER01
1990 05 20.27	B	5.8	AA	5.0	B		12					GRE
1990 05 20.27	S	5.3	AA	5.0	B		12	&20	5/			GRE
1990 05 20.33				5.0	B		10			2.0	005	MOR
1990 05 20.33				5.0	B		10			3.0	307	MOR
1990 05 20.33				5.0	B		10			5.5	275	MOR
1990 05 20.33	M	5.1	AA	5.0	B		10	18	4	3.0	260	MOR
1990 05 20.33	S	4.5	A	7.0	B		10	23				DEA
1990 05 20.89	S	5.0	AA	0.0	E		1					PEA
1990 05 20.89	S	5.3	AA	8.0	B		20	9	6	0.3	270	PEA
1990 05 20.95	S	5.4	AC	15.2	L	5	44	13.5	3	0.8	280	MOE
1990 05 21.04	B	5.7	AA	5.0	R	10	13			&0.4	240	JAH
1990 05 21.04	E	5.4	AA	0.8	E			&15	4			JAH
1990 05 21.04	S	5.6	AA	5.0	R	10	13	12	3	&0.8	160	JAH
1990 05 21.05				5.0	R	10	56	9.6	3			JAH
1990 05 21.06				20.4	L	6	72	7.0	3	&1.1	170	JAH
1990 05 21.16	S	5.0	AA	4.0	R	15	8	&14	3			PER01
1990 05 21.31	S	4.4	A	7.0	B		10	22.5				DEA
1990 05 21.40	M	5.7	SC	5.0	B		10	&10	4			HAL
1990 05 21.46	M	5.2	AA	5.0	B		10	18	4			MOR
1990 05 21.89	S	5.0	AA	0.0	E		1					PEA
1990 05 21.89	S	5.3	AA	8.0	B		20	10	6/			PEA
1990 05 22.32	B	5.6	Y	5.0	B		7					MEI01
1990 05 22.88	S	5.0	AA	0.0	E		1	&24				PEA
1990 05 22.88	S	5.3	AA	8.0	B		20	11	6/			PEA
1990 05 22.92	B	5.9	AC	5.0	B		7	14	2			MOE
1990 05 22.96	B	5.6	AA	5.0	R	10	13	16	3			JAH
1990 05 22.96	S	5.7	AA	5.0	R	10	13					JAH
1990 05 22.97				5.0	R	10	56	8.2	1			JAH
1990 05 23.00				20.4	L	6	72	&15	3			JAH
1990 05 23.07	S	5.2	AA	3.4	B		9	&15	4			PER01
1990 05 23.14	I	5.5	AA	0.0	E		1					PER01
1990 05 23.14	S	5.1	AA	0.0	E		1	&16	0/			PER01
1990 05 23.14	S	5.5	AA	3.5	B		7	19	6			CAM
1990 05 23.27	B	5.0	AA	3.5	B	2	2	&20	7			ROB03
1990 05 23.89	S	5.0	AA	0.0	E		1					PEA
1990 05 23.89	S	5.3	AA	8.0	B		20	9	6			PEA

Comet Austin 1989c1 [cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1990 05 23.95				5.0	R	10	56	7.5	1			JAH
1990 05 23.95	B	5.9	AA	5.0	R	10	13					JAH
1990 05 23.95	S	5.7	AA	5.0	R	10	13	14	2	&1.0	310	JAH
1990 05 23.98				0.8	E			&20	3			JAH
1990 05 24.00				20.4	L	6	72	11	3	&1.0		JAH
1990 05 24.08	S	5.0	A	5.0	B		10	>20	2/	2		KID
1990 05 24.89	S	4.9	AA	0.0	E		1	&40				PEA
1990 05 24.89	S	5.2	AA	8.0	B		20	8	6			PEA
1990 05 24.98				0.8	E			&20	1			JAH
1990 05 24.98				5.0	R	10	56	& 9	3			JAH
1990 05 24.98	S	5.6	AA	5.0	R	10	13					JAH
1990 05 24.98	S	5.7	AA	5.0	R	10	13	17	4	&1.0		JAH
1990 05 25.02				20.4	L	6	72	11.5	3			JAH
1990 05 25.06	S	5.0	A	5.0	B		10	15	2			KID
1990 05 25.11	S	5.3	AA	3.5	B		7	22	6			CAM
1990 05 25.15		4.7	A	0.0	E		1					DEA
1990 05 25.30	B	6.2	AA	5.0	B		12					GRE
1990 05 25.30	B	6.6	S	5.0	B		7	&20			230	MEI01
1990 05 25.30	S	5.2	AA	5.0	B		12	&18	3			GRE
1990 05 25.43	M	5.5	AA	5.0	B		10	18	3/			MOR
1990 05 25.93	B	6.0	AA	5.6	B		8	22	4			JAH
1990 05 25.98	S	4.6	A	5.0	B		10	16	4	1	302	LOO01
1990 05 25.99	B	5.0	A	5.0	B		10					LOO01
1990 05 26.08	S	5.8	AA	8.0	R	3	11	&25	3			PER01
1990 05 26.15		4.9	A	0.0	E		1					DEA
1990 05 26.29				5.0	B		10			3.5	280	MOR
1990 05 26.29	M	5.3	AA	5.0	B		10	20	3/	4.5	320	MOR
1990 05 27.06	S	6.1	AA	4.0	R	15	8	&10	1/			PER01
1990 05 27.13		5.5	A	0.0	E		1					DEA
1990 05 27.29				5.0	B		10			1.75	280	MOR
1990 05 27.29				5.0	B		10			2.0	010	MOR
1990 05 27.29				5.0	B		10			5.0	310	MOR
1990 05 27.29	M	5.5	AA	5.0	B		10	20	3/	0.25	125	MOR
1990 05 27.91	B	6.4	AC	5.0	B		7	15	1			MOE
1990 05 28.29	B	7.0	AA	5.0	B		12					GRE
1990 05 28.29	S	5.7	AA	5.0	B		12	&13	3			GRE
1990 05 28.87	S	5.6	AA	8.0	B		20		5			PEA
1990 05 28.98				5.0	R	10	56	7.7	1			JAH
1990 05 28.98	B	6.2	AA	5.0	R	10	13					JAH
1990 05 28.98	S	6.1	AA	5.0	R	10	13	9.6	3			JAH
1990 05 28.99				20.4	L	6	72	6.4	2			JAH
1990 05 29.07	S	6.5	AA	4.0	R	15	8	& 7	1			PER01
1990 05 29.98				5.0	R	10	56	5	2			JAH
1990 05 29.98	B	6.3	AA	5.0	R	10	13					JAH
1990 05 29.98	S	6.3	AA	5.0	R	10	13	12	3			JAH
1990 05 29.99				20.4	L	6	72	6.1	4			JAH
1990 05 30.89	S	5.7	AA	8.0	B		20	7	5	2.0	316	PEA
1990 05 31.03	S	6.2	AA	5.0	B		7	16	5	1.3	330	MIK
1990 05 31.30	B	5.5	S	6.3	B		9	&20	2	&2	325	CHE
1990 05 31.34	S	6.0	AA	20.3	L	6	43	& 4	1/			GRE
1990 06 01.29	B	5.7	AA	8.0	B		11	19	6	2.0	323	ROB03
1990 06 01.30	S	6.4	AA	8.0	R	3	20	& 8	0/			GRE
1990 06 02.40	M	5.2	AA	5.0	B		10	19.5	3	3.5	329	MOR
1990 06 02.43				8.0	B		20			0.17	110	MOR
1990 06 03.42				8.0	B		20			0.17	130	MOR
1990 06 03.42	M	6.0	AA	5.0	B		10	17.0	4	4.0	335	MOR
1990 06 04.43	M	5.6	AA	5.0	B		10	16.5	3/	2.25	328	MOR

Comet Skorichenko-George 1989e1

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1989 12 21.76	M	10.5	AC	25.4	J	6	73	1.8	4			BOU
1989 12 24.75	B	10.5	CS	20.3	T	10	62	2	4			GAR02
1990 01 04.78	B	10.2	A	20	R	15	60					KOR01
1990 01 04.78	S	10.2	A	20	R	15	60					KOR01
1990 01 13.99	S	10.0	AC	31.7	L	6	68	2.0	3			BOR
1990 01 18.75	M	9.7	AC	25.4	J	6	59	2.2	3/			BOU
1990 01 26.76	M	9.7	AC	25.4	J	6	59	2.2	4			BOU
1990 02 05.76	S	8.9	AA	8.0	B		15	2	2/			KOR
1990 02 09.79	M	9.3	AC	25.4	J	6	59	& 2	4			BOU
1990 02 09.79	S	8.8	AA	8.0	B	5	40	1	5			BAR
1990 02 14.16	S	9.0	AA	20	T	10	77	3.0	4			PRY
1990 02 18.01	S	9.7	AC	31.7	L	6	68	2.0	4			BOR
1990 02 18.01	S	9.8	AC	12.0	B		20	2.4				BOR
1990 02 18.78	M	9.1	AC	25.4	J	6	58	2.0	4			BOU
1990 02 19.17	S	9.0	AA	20	T	10	95	2.7	3			PRY
1990 02 20.77	S	8.4	AA	8.0	B		15	3	2			KOR
1990 02 21.01	S	9.4	AC	31.7	L	6	68	2.4	4			BOR
1990 02 22.00	S	9.5	AC	31.7	L	6	68	2.4	4			BOR
1990 02 22.79	M	8.9	AC	25.4	J	6	58	2.0	4			BOU
1990 02 23.17	S	8.8	AA	20	T	10	63	3.0	5	?		PRY
1990 02 23.79	M	8.9	AC	25.4	J	6	58	2.0	3/			BOU
1990 02 24.78	S	9.2	AA	8.0	B		15	3	3			MIK
1990 02 27.01	S	9.5	AC	31.7	L	6	68	2.2	4			BOR
1990 02 27.16	S	8.9	AA	20	T	10	95	3.5	4			PRY
1990 02 28.16	S	8.9	AA	20	T	10	77	2.7	4			PRY
1990 03 01.17	S	8.9	AA	20	T	10	95	2.7	4			PRY
1990 03 02.17	S	8.9	AA	20	T	10	63	2.5	4			PRY
1990 03 04.78	S	9.3	AA	8.0	B		15	2	2			MIK
1990 03 04.81	B	8.9	A	20	R	15	60	1				KOR01
1990 03 04.81	S	8.9	A	20	R	15	60					KOR01
1990 03 05.90	B	9.0	A	20	R	15	60					KOR01
1990 03 06.89	B	9.0	A	20	R	15	60	2				KOR01
1990 03 11.82	B	9.1	A	20	R	15	60	3				KOR01
1990 03 13.81	S	8.0	SC	25.4	L	6	45	8	3			DAN01
1990 03 13.83	B	9.0	A	20	R	15	60					KOR01
1990 03 14.79	S	8.7	AA	20.4	L	6	72	2.4	3			JAH
1990 03 14.86	B	9.2	A	20	R	15	60					KOR01
1990 03 16.81	S	8.8	AA	20.4	L	6	72	1.2	2			JAH
1990 03 16.81	S	9.2	AC	25.4	J	6	58	2.0	3/			BOU
1990 03 17.79	S	8.9	AA	20.4	L	6	72	2.0	4			JAH
1990 03 17.81	S	9.2	AC	25.4	J	6	58	& 2	4			BOU
1990 03 18.81	S	8.7	AA	8.0	B		15	2	3			KOR
1990 03 18.81	S	8.9	AA	20.4	L	6	72	1.5	3			JAH
1990 03 18.85	S	9.2	AC	25.4	J	6	58		3/			BOU
1990 03 19.03	S	9.1	AC	31.7	L	6	68	2.8	4			BOR
1990 03 19.86	B	9.2	A	20	L	10	38	2				KOR01
1990 03 20.80	S	9.3	AA	20.4	L	6	72	& 2.5	1			JAH
1990 03 20.82	S	9.1	AC	25.4	J	6	58	2.2	3			BOU
1990 03 20.83	S	8.0	SC	25.4	L	6	45	& 9	3/			DAN01
1990 03 21.86	B	9.3	A	20	R	15	60	4				KOR01
1990 03 22.02	S	9.2	AC	31.7	L	6	68	2.3	4			BOR
1990 03 22.84	S	9.0	AC	25.4	J	6	58	2.0	3			BOU
1990 03 24.03	S	9.3	AC	31.7	L	6	68	2.5	3			BOR
1990 03 24.15	S	9.0	AA	8.0	B		20	8.0	2			MOR
1990 03 25.17	S	8.6	AA	20	T	10	77	2.4	4			PRY
1990 03 25.85	S	9.1	AA	20.4	L	6	72	3.1	4			JAH
1990 03 26.04	S	9.5	AC	20.0	L	6	60	1.0	2			NOW
1990 03 26.16	S	9.0	AA	8.0	B		20	8.0	2			MOR
1990 03 26.19	S	8.7	AA	20	T	10	95	2.4	4			PRY

Comet Skorichenko-George 1989e1 [cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1990 03 26.83	M	9.0	AC	25.4	J	6	58	2.1	4			BOU
1990 03 26.83	S	9.0	SC	8.0	B	.	20	6	3			KAR02
1990 03 26.86	S	9.0	SC	20.0	L	4	90	4.3	2			YDE
1990 03 27.02	S	9.0	AC	15.2	L	5	30	2.0	2			HER02
1990 03 27.03	S	9.3	AC	31.7	L	6	68	2.1	4			BOR
1990 03 27.16	S	9.0	AA	8.0	B		20	7.5	2			MOR
1990 03 28.04	S	9.1	AC	15.2	L	5	30	2.0	2			HER02
1990 03 28.15	M	9.5	AC	41	L	4	83					HAL
1990 03 28.83	S	9.2	AC	25.4	J	6	58	2.0	4			BOU
1990 03 29.82	S	9.3	AA	20.4	L	6	72	1.5	1			JAH
1990 03 30.83	S	9.3	AC	25.4	J	6	72	1.9	3			BOU
1990 03 30.84	S	7.8	SC	8.0	B		20	2	7			EKL
1990 03 31.83	S	9.8	AC	20.4	L	6	72	1.6	0			JAH
1990 04 04.85	S	9.4	AC	20.4	L	6	72	1.7	3			JAH
1990 04 05.85	S	9.9	AC	20.4	L	6	72	1.9	2			JAH
1990 04 07.88	S	10.2	AC	20.3	T	10	133	1.1	4			DAH
1990 04 12.04	S	9.3	AC	31.7	L	6	68	2.0	3			BOR
1990 04 13.05	S	9.3	AC	31.7	L	6	68	1.9	3			BOR
1990 04 13.81	S	9.7	AC	8.0	B		20	2.5	1			BOA
1990 04 13.81	S	9.9	AC	8.0	B		20		1			BAR04
1990 04 13.94	**S**	**9.3**	**AC**	**20.3**	**T**	**10**	**80**	**2.8**	**2/**			**GRA04**
1990 04 14.05	S	9.3	AC	31.7	L	6	68	2.3	3			BOR
1990 04 14.14	M	9.6	AC	41	L	4	83					HAL
1990 04 16.20	S	9.1	AA	20	T	10	95	1.7	2			PRY
1990 04 17.86 !	M	9.2	AC	25.4	J	6	58	1.8	3/			BOU
1990 04 19.05	S	10.0	AC	31.7	L	6	68	1.8	2			BOR
1990 04 22.15	M	9.7	AC	41	L	4	83					HAL
1990 04 22.17	M	9.8	AA	25.6	L	4	67	2.0	2/			MOR
1990 04 22.87 !	S	9.3	AC	25.4	J	6	58	& 2	3/			BOU
1990 04 25.87 !	S	9.3	AC	25.4	J	6	58	& 2	3			BOU
1990 04 27.92	S	9.7	S	31.6	L	5	130	2	3			MID01
1990 05 01.86	S	10.6	AC	20.4	L	6	72	1.1	2			JAH

Comet McKenzie-Russell 1989f1

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1990 01 01.95		13.5:		20.3	T	10	62	1	2			GAR02

Comet Černis-Kiuchi-Nakamura 1990b

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1990 03 18.82	B	8.7	AA	20.4	L	6	72					JAH
1990 03 18.82	S	8.0	AA	20.4	L	6	72	2.2	6			JAH
1990 03 18.82	S	8.5	AA	8.0	B		15	& 3	2			KOR
1990 03 18.85	M	8.0	AA	25.4	J	6	58	2.5	5			BOU
1990 03 18.85	S	8.1	AA	5.0	B		10	& 3	2			BOU
1990 03 20.81	B	9.0	AA	20.4	L	6	72			0.08	200	JAH
1990 03 20.81	S	8.8	AA	20.4	L	6	72	2.7	6	0.08	95	JAH
1990 03 20.82	M	8.1	AA	25.4	J	6	47	2.8	5			BOU
1990 03 22.03				31.7	L	6	68	2.7	6			BOR
1990 03 22.03	S	8.2	AC	5.0	B		10	3.5				BOR
1990 03 22.84	S	8.1	AA	4.0	R		10		7			BOU
1990 03 22.85	M	8.0	AA	25.4	J	6	47	3.0	6			BOU
1990 03 22.86	S	8.1	AA	8.0	R		20		6			BOU
1990 03 24.04				31.7	L	6	68	2.8	5/			BOR
1990 03 24.04	S	8.3	AC	5.0	B		10	3	5			BOR
1990 03 24.04	S	8.5	AC	8.0	B		20	2.7	5			BOR
1990 03 24.18	M	7.8	AA	8.0	B		20	3	6			MOR
1990 03 25.19	S	7.8	AA	20	T	10	77	2.7	6			PRY

Comet Černis-Kiuchi-Nakamura 1990b [cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1990 03 25.84	S	7.5:	AA	20.4	L	6	72	2.9	6			JAH
1990 03 26.02	B	8.8	AC	20.0	L	6	60	3.37	3			NOW
1990 03 26.03	S	8.5	AC	15.2	L	5	30	3	6	0.03	50	HER02
1990 03 26.04				31.7	L	6	68	3.7	5			BOR
1990 03 26.04	S	8.4	AC	8.0	B		20	4.8	3/			BOR
1990 03 26.17	M	8.2	AA	8.0	B		20	6	4			MOR
1990 03 26.18	S	8.4	AA	20	T	10	77	2.4	4			PRY
1990 03 26.82	S	8.5	SC	8.0	B		20	5	5/			KAR02
1990 03 26.84	M	8.1	AA	25.4	J	6	47	2.5	6			BOU
1990 03 26.84	S	8.8	SC	20	L	4	90	4.3	3			YDE
1990 03 26.88	S	9.0	SC	15.2	L	8	67	2	4			WAR01
1990 03 27.03	S	8.5	AC	15.2	L	5	30	3	6	0.03	50	HER02
1990 03 27.05				31.7	L	6	68	2.7	5			BOR
1990 03 27.05	S	8.9	AC	8.0	B		20	3.6	3			BOR
1990 03 27.17	S	8.8	AA	8.0	B		20	4	3			MOR
1990 03 27.85	S	7.9	SC	25.4	L	6	45	& 5.5	5			DAN01
1990 03 27.91	S	8.9	V	20	T	10	63		3			VES
1990 03 28.03	S	8.5	AC	15.2	L	5	30	3.5	6	0.03	52	HER02
1990 03 28.17	S	8.4	AC	5.0	B		10					HAL
1990 03 28.84	M	8.3	AA	25.4	J	6	47	2.5	4/			BOU
1990 03 29.83	B	9.7	AA	20.4	L	6	72					JAH
1990 03 29.83	S	9.3	AA	20.4	L	6	72	2.0	3			JAH
1990 03 30.84	S	8.6	AA	25.4	J	6	47	2.7	3/			BOU
1990 03 30.85	S	9.5	AA	20.4	L	6	72	2.2	1			JAH
1990 03 30.88	S	9.5	SC	15.2	L	8	67	2	4			WAR01
1990 03 31.85	B	9.7	AA	20.4	L	6	72					JAH
1990 03 31.85	S	9.4	AA	20.4	L	6	72	3.2	2			JAH
1990 04 01.12	S	9.0	AC	25.4	J	6	58	2.8	2/			BOU
1990 04 01.17	S	8.9	AA	14.0	S	4	28	3.5	1			SPR
1990 04 01.81	S	9.8	AC	15.2	L	5	44	& 2	2			MOE
1990 04 02.12	S	9.5	AC	25.4	J	6	58	2.5	2			BOU
1990 04 03.17	S	8.7	AA	14.0	S	4	28	3	2			SPR
1990 04 04.17	S	8.9	AA	14.0	S	4	28	3	1			SPR
1990 04 04.18	M	8.9	AC	41	L	4	83					HAL
1990 04 04.88	S	9.9	AA	20.4	L	6	72	2.1	1			JAH
1990 04 05.84	S	10.2	AC	15.2	L	5	100	& 1.5	2			MOE
1990 04 05.87	S	10.2	AC	20.4	L	6	72	1.8	3			JAH
1990 04 07.06	S	10.0	AC	20.3	T	10	80	1.9	3			GRA04
1990 04 07.18	S	9.1	AA	20.0	T	10	128	3	2			SPR
1990 04 09.85	S	9.2	AA	36.0	T	11	123	3	2	&0.16	350	KOR
1990 04 10.81	S	9.1	AC	8.0	B		20	3	3			BOA
1990 04 10.81	S	9.3	AC	8.0	B		20					BAR04
1990 04 10.82	O	9.0	AA	33.5	L	4	100	1				RIP
1990 04 12.05	S	8.8	AC	15.2	L	5	30	4	5			HER02
1990 04 12.05	S	9.0	AC	31.7	L	6	68	2.7	3/			BOR
1990 04 13.06	S	9.1	AC	31.7	L	6	68	2.3	4			BOR
1990 04 13.83	S	9.3	AC	8.0	B		20					BAR04
1990 04 13.84	S	9.2	AC	8.0	B		20	3.5	2			BOA
1990 04 14.06	S	9.4	AC	31.7	L	6	68	3.3	4			BOR
1990 04 14.06	S	9.5	AC	8.0	B		20	3.7				BOR
1990 04 14.06	S	10.3	AC	20.3	T	10	80	1.9	3			GRA04
1990 04 14.17	S	8.9	NP	5.0	B		10					HAL
1990 04 15.84	S	9.5	AC	15.2	L	5	44	3	1			MOE
1990 04 15.99	B	9.2	AC	35	T	6	113		2			AMO
1990 04 16.00	B	9.3	AC	8.0	B		10		1			AMO
1990 04 16.21	S	8.9	AA	20	T	10	95	2.0	3			PRY
1990 04 17.88	M	10.1	AC	25.4	J	6	72	1.8	5			BOU
1990 04 18.09	S	10.0	AC	31.7	L	6	68	2.7	2			BOR
1990 04 19.08	S	10.0	AC	31.7	L	6	68	2.4	2			BOR

Comet Černis-Kiuchi-Nakamura 1990b [cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1990 04 19.95	S	10.0	AC	15	L	4	26	3	3/			PER01
1990 04 21.20	S	9.8	AC	41	L	4	83					HAL
1990 04 21.84	O	9.5	AA	33.5	L	4	165	0.5				RIP
1990 04 22.21	S	11.9	NP	25.6	L	4	111	2.0	1/			MOR
1990 04 25.89	S	12.3	AC	25.4	J	6	88	& 2.0	1			BOU
1990 04 25.94	S	10.9	AC	20.3	T	10	80	2.7	2			GRA04
1990 04 28.00	S	10.8	S	31.6	L	5	130	1.1	2			MID01
1990 04 28.17	S	11.9	NP	25.6	L	4	67	2.3	1			MOR
1990 04 29.89	S	10.2	AC	36.0	T	11	260	2	1			KOR
1990 05 12.16	I[	13.0		41	L	4	183					HAL
1990 05 14.19	S	12.2	NP	25.6	L	4	111	1.8	0/			MOR
1990 05 20.20	S[	12.4	NP	25.6	L	4	156					MOR
1990 05 21.18	I[	13.5		41	L	4	183					HAL

Comet Levy 1990c

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1990 05 21.44	M	10.1	AC	41	L	4	83	& 1	6			HAL
1990 05 21.44	M	10.5	NP	25.6	L	4	67	1.5	4			MOR
1990 05 22.89	S	10.3	VN	20	L	4	45		5			PEA
1990 05 23.90	S	10.3	VN	20	L	4	45	2	5			PEA
1990 05 24.90	S	10.2	VN	20	L	4	45	2.2	5			PEA
1990 05 27.46	S	9.7	NP	8.0	B		20					MOR
1990 05 28.87	S	10.4	AA	20	L	4	45	1.8				PEA
1990 05 30.90	S	10.2	AA	20	L	4	45	1.7	5			PEA
1990 05 31.33	B	10.2:	S	20	T	10	78	& 4	4			CHE
1990 05 31.33	S	9.7	GA	20.3	L	6	43	& 4	2			GRE
1990 06 02.44				25.6	L	4	111			0.10	270	MOR
1990 06 02.44	M	9.6	NP	8.0	B		20	6.0	6			MOR
1990 06 03.43	M	9.7	NP	8.0	B		20	5.0	7			MOR
1990 06 03.44				25.6	L	4	156			0.10	290	MOR
1990 06 04.15	S	9.5	AA	15	L	4	26	2.5	0/			PER01
1990 06 04.45	M	9.6	NP	8.0	B		20	5.0	6			MOR

Periodic Comet Tuttle-Giacobini-Kresák (1989b1)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1990 01 24.68	S	11.1	LM	20	L	7	35	3	5			CAM03
1990 01 29.21				25.4	J	6	117	& 1.5	1			BOU
1990 02 04.74	S	11.5	LM	20	L	7	35	4	4			CAM03
1990 02 07.75	S	11.7	LM	20	L	7	35	4	4			CAM03
1990 02 22.19	S	11.8:	AC	25.4	J	6	115	1.0	1/			BOU
1990 03 03.58	S	12.2	LM	20	L	7	56	4	4			CAM03
1990 03 09.76	S	12.6	LM	20	L	7	56	4	5			CAM03
1990 03 24.51	S[	12.5	NP	25.6	L	4	156					MOR

Periodic Comet Pons-Winnecke (1989g)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1989 08 27.84	S	13.0:	GA	106.0	L	3	179	& 1	3			BOU

Periodic Comet Tempel 2 (1988 XIV)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1988 08 06.53	S	10.8	AC	20	L	6	67	3.5	2/			NAK01
1988 08 12.55	S	10.0	AC	20	L	6	65	4.5	2			NAK01
1988 08 13.46	S	9.5	S	20	T	10	50					OHT
1988 08 31.45	S	10.0	AC	20	L	6	58	4.5	1			NAK01
1988 09 09.44	S	8.5	AC	20	L	6	46	8	2			NAK01

Periodic Comet Tempel 2 (1988 XIV) [cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1988 10 08.43	S	8.7	AA	20	L	6	58	4	1			NAK01
1988 10 09.43	S	8.9	AA	20	L	6	58	5.5	1/			NAK01
1988 10 14.43	S	8.6	AC	20	L	6	58	5	2			NAK01
1988 10 15.41	S	8.3	AC	20	L	6	58	5	1/			NAK01
1988 10 16.39	S	8.6	AC	20	L	6	58	4.5	1/			NAK01
1988 10 29.41	S	9.1	AA	20	L	6	58	5	1			NAK01
1988 10 30.37	S	10.5	AA	20	T	10	50					OHT
1988 10 30.40	S	9.1	AA	20	L	6	58	4.5	0/			NAK01
1988 11 03.40	S	9.3	AC	20	L	6	58	5.5	2			NAK01
1988 11 06.43	S	9.6	AC	20	L	6	58	4	1			NAK01
1988 11 12.39	S	9.7	AC	20	L	6	58	4.5	2			NAK01
1988 11 13.37	S	10.0	AC	20	T	10	50					OHT
1988 11 30.40	S	10.3	AC	20	L	6	58	4	1			NAK01
1988 12 07.38	S	10.7	AC	20	L	6	65	3	1			NAK01
1988 12 10.38	S	10.7	AC	20	L	6	58	3.5	0			NAK01
1988 12 11.37	S	12.1	AC	20	T	10	50					OHT
1988 12 25.38	S	11.0	AC	20	L	6	58	2.5	1/			NAK01
1988 12 30.41	S	11.6	AC	20	T	10	50					OHT

Periodic Comet Schwassmann-Wachmann 3 (1989d1)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1990 02 22.15	S[	13.0	AC	25.4	J	6	115	! 1.0				BOU
1990 03 17.03	S	10.5:	AC	20.4	L	6	72	2.0	1			JAH
1990 03 21.60	S	12.1	LM	20	L	7	56	4	3			CAM03
1990 03 23.15	S	12.6	AC	25.4	J	6	115	1.2	6			BOU
1990 03 23.59	S	12.0	LM	20	L	7	56	4	4			CAM03
1990 03 24.48	M	11.9	NP	25.6	L	4	111	1.9	3		270	MOR
1990 03 27.10	S	12.1	AC	25.4	J	6	58	& 1.5	5			BOU
1990 03 29.48	M	12.1	AC	41	L	4	83					HAL
1990 03 31.49	M	11.3	NP	25.6	L	4	111	1.0	4/	0.07	270	MOR
1990 03 31.63	S	11.5	LM	20	L	7	56	5	3			CAM03
1990 04 01.11	S	11.2	AC	25.4	J	6	72	2.0	4			BOU
1990 04 01.48	M	11.2	NP	25.6	L	4	111	0.9	4/	0.10	270	MOR
1990 04 02.11	S	11.1	AC	25.4	J	6	72	2.0	3/			BOU
1990 04 03.78	S	10.8	LM	8.0	B		20	5	3			CAM03
1990 04 04.49	M	11.5	AC	41	L	4	83					HAL
1990 04 06.14	S	10.8	AC	20.4	L	6	72	1.4	5			JAH
1990 04 07.10	S	10.6	AC	20.3	T	10	133	1.0	5			DAH
1990 04 21.46	M	10.5	PI	41	L	4	83					HAL
1990 04 23.35	S	10.0	AC	31.7	L	6	68	1.1	5/	0.1	240	BOR
1990 04 24.34	S	9.9	AC	31.7	L	6	68	1.0	4/	0.1	232	BOR
1990 04 24.76	S	10.1	A	31.0	L	6	62	4	3	0.2	255	KOB01
1990 04 24.80	S	10.1	LM	20	L	7	56	3	7	0.25	270	CAM03
1990 04 25.81	S	10 :	LM	20	L	7	56	3	5	0.17	240	CAM03
1990 04 26.74	S	9.9	LM	8.0	B		20	4	7	0.17	260	CAM03
1990 04 26.76	S	9.9	LM	20	L	7	56	4	5	0.33	265	CAM03
1990 04 26.81	S	10.6	VN	41	L	4	90	1.3	4/	0.04	259	PEA
1990 04 27.32	S	8.6	S	7.0	B		10	6				DEA
1990 04 27.73	S	9.9	LM	20	L	7	56	3	4	0.33	270	CAM03
1990 04 27.74	S	9.8	LM	8.0	B		20	5	5			CAM03
1990 04 27.87	S	10.4	VN	20	L	4	45	1.8	4/	0.07	263	PEA
1990 04 28.46	M	9.4	AA	25.6	L	4	45		4	0.25	250	MOR
1990 04 28.80	S	10.3	VN	25.6	L	4	56	2	5	0.2	257	PEA
1990 04 29.30	S	8.4	S	7.0	B		10	4				DEA
1990 04 29.48	M	9.5	AA	25.6	L	4	45	1.8	4	0.15	255	MOR
1990 04 29.80	S	9.9	LM	20	L	7	56	5	4	0.50	230	CAM03
1990 04 29.81	S	9.8	LM	20	L	7	35	6	5	0.25	230	CAM03
1990 04 29.84	S	10.2	VN	20	L	4	45	1.9	4	0.12	256	PEA

Periodic Comet Schwassmann-Wachmann 3 (1989d1) [cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1990 04 30.32	S	8.7	S	7.0	B		10	4				DEA
1990 04 30.44	M	10.3	PI	41	L	4	83					HAL
1990 05 01.87	S	10.1	VN	20	L	4	45	2	4/	0.1	250	PEA
1990 05 04.32	S	8.5	S	7.0	B		10					DEA
1990 05 04.45	M	10.2	AC	41	L	4	83					HAL
1990 05 05.31	S	8.5	S	7.0	B		10					DEA
1990 05 05.88	S	10.1	VN	20	L	4	45	1.6	5	0.13	253	PEA
1990 05 06.88	S	10.1	VN	20	L	4	45	1.5	5	0.18	252	PEA
1990 05 19.87	S	10.4	VN	20	L	4	45	1.8	4	0.06	239	PEA
1990 05 20.47	S	9.5	AA	25.6	L	4	67	2.0	2/			MOR
1990 05 20.87	S	10.5	VN	20	L	4	45	1.2	4	0.08	243	PEA
1990 05 21.46	M	10.4	AC	41	L	4	83					HAL
1990 05 21.87	S	10.4	VN	20	L	4	45	1.3	4	0.07	234	PEA
1990 05 22.87	S	10.4	VN	20	L	4	45	1.4	4	0.07	244	PEA
1990 05 23.87	S	10.5	VN	20	L	4	45	1.5	5	0.05	244	PEA
1990 05 24.87	S	10.5	VN	20	L	4	45	1.5		0.05		PEA
1990 05 27.47		9.7:	AA	20.0	L	6	55		2/			MOR
1990 05 30.88	S	10.7	VN	20	L	4	45	1.5	4			PEA
1990 06 02.46	S	9.9	AC	25.6	L	4	67	1.9	2/			MOR
1990 06 03.47	S	10.2	AC	25.6	L	4	67	1.9	3		220	MOR
1990 06 04.47	S	10.5	AC	25.6	L	4	67	1.4	3			MOR

Periodic Comet Borrelly (1987 XXXIII)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1987 12 08.00	M	8.5	AC	20.3	T	10	123	1.9	5			GRA04
1987 12 10.84	M	8.0	AC	20.3	T	10	80	3.3	5			GRA04
1987 12 13.74	S	8.0	AC	20.3	T	10	80	4	5			DAH
1987 12 16.97	M	8.0	AC	20.3	T	10	80	2.3	5			GRA04
1987 12 21.75	S	8.0	AC	20.3	T	10	80	4	4			DAH
1987 12 25.96	S	8.0	AC	20.3	T	10	80	4	5			DAH
1988 01 07.02	M	8.7	AC	20.3	L	6	49	2.5	2			GRA04

Periodic Comet Gunn

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1989 04 12.69	S	13.1	AC	20	L	6	106	1.2	4/			NAK01
1989 04 13.71	S	13.7	AC	26	L	5	146	0.7	2/			KAN
1989 04 28.63	S	13.3	AC	26	L	5	146	0.8	2			KAN
1989 04 29.65	S	12.8	AC	20	L	6	106	1.2	5			NAK01
1989 05 02.64	S	12.8	AC	20	L	6	106	1.6	3/			NAK01
1989 05 08.68	S	12.9	AC	20	L	6	150	0.8	4			NAK01
1989 05 26.57	S	13.0	AC	20	L	6	106	1.3	4/			NAK01
1989 05 31.56	S	13.1	AC	20	L	6	106	1.4	4			NAK01

Periodic Comet Wild 4 (1990a)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1990 01 29.19	S	12.8	AC	25.4	J	6	117	0.5	4/			BOU
1990 02 03.19	S	12.7	AC	25.4	J	6	117	0.7	3/			BOU
1990 02 09.80	S	12.7	AC	25.4	J	6	117	0.8	3/			BOU
1990 02 16.90	S	13.1	AC	36.0	T	11	123	0.5	7			KOR
1990 02 17.00	S	12.6	AC	25.4	J	6	88	0.9	4			BOU
1990 02 17.52	S	12.9	LM	20	L	7	56	1.5	8			CAM03
1990 02 18.80	S	12.6	AC	25.4	J	6	88	0.9	4			BOU
1990 02 20.59	S	12.9	LM	20	L	7	56	1.5	8			CAM03
1990 02 20.97	S	12.7	AC	36.0	T	11	123	0.8	6/			KOR
1990 02 21.98	S	12.8	AC	36.0	T	11	123	0.7	7			KOR
1990 02 22.14	S	12.5	AC	25.4	J	6	88	0.7	4/			BOU

Periodic Comet Wild 4 (1990a) [cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1990 02 22.83	S	12.6	AC	25.4	J	6	88	0.8	3/			BOU
1990 02 22.99	S	12.7	AC	36.0	T	11	123	0.7	7			KOR
1990 02 23.60	S	12.9	LM	20	L	7	56	1.5	8			CAM03
1990 02 23.80	S	12.6	AC	25.4	J	6	115	0.8	4			BOU
1990 02 24.50	S	12.8	LM	20	L	7	56	1.5	8			CAM03
1990 03 03.55	S	12.9	LM	20	L	7	56	1.5	8			CAM03
1990 03 12.84	S	12.4	AC	36.0	T	11	260	0.4	8			KOR
1990 03 14.86	S	12.0	AC	20.4	L	6	72	1.5	2			JAH
1990 03 15.88	S	12.5	AC	36.0	T	11	260	0.5	6/			KOR
1990 03 16.83	M	12.6	AC	25.4	J	6	88	0.9	5/			BOU
1990 03 16.85	S	12.7	AC	36.0	T	11	260	0.5	6/			KOR
1990 03 17.83	S	12.6	AC	25.4	J	6	88	0.9	5			BOU
1990 03 17.83	S	12.7	AC	36.0	T	11	260	0.5	7			KOR
1990 03 18.86	S	12.5	AC	25.4	J	6	88	1.0	5			BOU
1990 03 18.86	S	13.0	AC	36.0	T	11	260	0.3	7/			KOR
1990 03 19.46	S	12.6	LM	20	L	7	56	2	8			CAM03
1990 03 20.83	S	12.5	AC	25.4	J	6	115	1.0	4/			BOU
1990 03 22.06	S	12.7	AC	31.7	L	6	110	0.6				BOR
1990 03 22.06	S	12.7	AC	50.0	L	5	96	0.6	6	?	135	BOR
1990 03 22.86	S	12.5	AC	25.4	J	6	88	1.0	4/			BOU
1990 03 23.55	S	12.7	LM	20	L	7	56	2	8			CAM03
1990 03 24.19	S	11.5	NP	25.6	L	4	111	1.6	3	?	90	MOR
1990 03 25.85	S	12.5	AC	20.4	L	6	72	0.8	3			JAH
1990 03 26.84	S	12.6	AC	25.4	J	6	143	0.8	6			BOU
1990 03 27.09	S	12.6	AC	31.7	L	6	110	0.7	3			BOR
1990 03 27.90	S	12.7	AC	36.0	T	11	260	0.6	6			KOR
1990 03 28.24	M	12.4	CA	41	L	4	83					HAL
1990 03 28.85	M	12.4	AC	25.4	J	6	88	1.0	6			BOU
1990 03 30.86	S	12.5	AC	25.4	J	6	88	1.0	5			BOU
1990 03 31.89	S	12.5	AC	20.4	L	6	72	& 1.6	1			JAH
1990 04 01.91	S	12.8	AC	36.0	T	11	260	0.4	6/			KOR
1990 04 13.07	S	13.0	AC	31.7	L	6	110	0.6				BOR
1990 04 14.07	S	12.8	AC	31.7	L	6	110	0.7				BOR
1990 04 14.20	M	12.5	CA	41	L	4	83					HAL
1990 04 17.89	S	12.7	AC	25.4	J	6	88	1.2	2/			BOU
1990 04 18.10	S	12.9	AC	31.7	L	6	110	0.6	5	?		BOR
1990 04 19.09	S	12.9	AC	31.7	L	6	110	0.6	5	?		BOR
1990 04 20.49	S	13.0	VN	41	L	4	90	0.8				PEA
1990 04 21.22	M	12.4	CA	41	L	4	83					HAL
1990 04 22.23	S	11.8	NP	25.6	L	4	111	1.0	2/			MOR
1990 04 22.90	S	13.0:	AC	25.4	J	6	143	& 1.0	1/			BOU
1990 04 24.57	S	12.5	S	31.0	L	6	62	1	3	0.03	100	KOB01
1990 04 25.90	S	12.9	AC	25.4	J	6	143	0.9	3			BOU
1990 04 27.98	S	12.5	AC	20.3	T	10	80	1.0	3/			GRA04
1990 04 28.20	S	11.8	NP	25.6	L	4	67	1.5	2/			MOR
1990 04 28.24	M	12.5	CA	41	L	4	83					HAL
1990 04 28.52	S	13.0	VN	41	L	4	90	1.2	4			PEA
1990 04 29.47	S	13.3	VN	41	L	4	200	0.7	3			PEA
1990 04 29.92	S	12.9	AC	36.0	T	11	260	0.7	2/			KOR
1990 05 12.18	M	12.6	CA	41	L	4	83					HAL
1990 05 14.20	M	11.9	NP	25.6	L	4	67	1.6	3			MOR
1990 05 14.48	S	13.0	VN	41	L	4	90	1.2	3			PEA
1990 05 15.49	S	13.2	VN	41	L	4	90	0.9	2			PEA
1990 05 16.49	S	13.2	VN	41	L	4	200		2			PEA
1990 05 20.22	S	11.9	NP	25.6	L	4	111	2.2	2/			MOR
1990 05 21.22	M	12.7	AC	41	L	4	83					HAL
1990 05 21.50	S	13.1	VN	41	L	4	90					PEA

Periodic Comet Gehrels 2 (1989n)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1989 11 17.84	S	14.0:	AC	36.0	T	11	260	0.2				KOR
1989 11 20.94	S	14.5:	AC	36.0	T	11	260	0.2	1			KOR

Periodic Comet Russell 3 (1989d)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1990 03 29.45	I	[13.5		41	L	4	183					HAL
1990 04 04.44	I	[13.5		41	L	4	183					HAL
1990 04 20.45	I	[13.0		41	L	4	183					HAL
1990 04 26.43	I	[13.0		41	L	4	183					HAL
1990 05 04.40	I	[13.0		41	L	4	183					HAL
1990 05 16.28	I	[13.5		41	L	4	183					HAL
1990 05 20.30	S	[13.3	NP	25.6	L	4	156					MOR
1990 05 21.28	I	[13.5		41	L	4	183					HAL

Periodic Comet Brorsen-Metcalf (1989o)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1989 07 09.46	S	9.8	S	10.8	L	5	32	6	1			MAC
1989 07 11.40	S	9.4	S	25.4	L	4	64	8	2			MAC
1989 07 12.45	S	9.2	S	25.4	L	4	64	8	4			MAC
1989 07 14.10	S	10.1	AC	12.7	T	10	40	3	1			GAR02
1989 07 14.34	S	8.9	S	25.4	L	4	64	8	4			MAC
1989 07 15.40	S	8.6	S	12.5	R	7	27	9	3			MAC
1989 07 16.08	S	11.0	AC	12.7	T	10	40	2	2			GAR02
1989 07 29.44	S	8.2	S	12.5	R	7	27	8	5			MAC
1989 07 30.46	S	8.0	S	12.5	R	7	27	10	4			MAC
1989 07 31.32	S	7.0	AC	3.5	B		7	11.5				MOR03
1989 08 01.01	B	6.8	S	3.0	R		6	9	4			GAR02
1989 08 01.02	S	7.5	AA	10.2	L	6	30	8	4			LUE
1989 08 01.03	S	7.5	AA	9.0	M	6	20	8	4			LUE
1989 08 01.35	S	7.3	AC	3.5	B		7	11				MOR03
1989 08 03.08	B	6.6	S	3.0	R		6	10	3			GAR02
1989 08 04.04	S	7.3	S	9.0	M	6	20	6	2			LUE
1989 08 04.94	S	6.8	S	5.0	B		7	8	3			LUE
1989 08 04.94	S	7.0	S	9.0	M	6	20	10	4	0.5	250	LUE
1989 08 04.95	B	6.7	S	9.0	M	6	20					LUE
1989 08 05.45	S	7.5	S	12.5	R	7	27	10	5			MAC
1989 08 06.33	S	7.3	AC	3.5	B		7	11				MOR03
1989 08 06.44	S	7.1	S	12.5	R	7	27	8	5			MAC
1989 08 06.96	S	6.6	S	9.0	M	6	20	5	2			LUE
1989 08 08.33	S	6.8	AC	3.5	B		7	7				MOR03
1989 08 09.08	B	6.3	S	3.0	R		6	10	5			GAR02
1989 08 09.34	S	6.7	AC	3.5	B		7	8				MOR03
1989 08 12.11	B	6.2	S	3.0	R		6	12	3			GAR02
1989 08 12.48	S	6.5	AA	12.5	R	7	27	9	4	0.45	287	MAC
1989 08 12.96	S	6.4	S	9.0	M	6	20	7	4			LUE
1989 08 12.98	S	6.2	S	9.0	M	6	20	8.5	4	0.1	260	LUE
1989 08 13.11	B	6.1	S	3.0	R		6	12	4			GAR02
1989 08 13.46	S	6.1	AA	12.5	R	7	27	8	5	0.50	278	MAC
1989 08 16.35	S	6.4	AC	3.5	B		7	6				MOR03
1989 08 19.36	S	6.2	AC	3.5	B		7	6.5				MOR03
1989 08 22.08	S	5.7	S	9.0	M	6	20	6	6	0.5	300	LUE
1989 08 22.08	S	5.8	S	5.0	B		10	6	4			LUE
1989 08 24.37	S	5.9	AA	3.5	B		7	5				MOR03
1989 08 25.37	S	5.7	AC	3.5	B		7	7				MOR03
1989 08 26.02	S	5.5	S	5.0	B		10	5	7			LUE
1989 08 26.02	S	5.5:	S	9.0	M	6	20			0.5	300	LUE
1989 08 26.37	S	5.9	AA	3.5	B		7	4				MOR03

Periodic Comet Brorsen-Metcalf (1989o) [cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1989 08 29.50	S	5.9	S	12.5	R	7	27	6	1	1.23	304	MAC
1989 08 31.15	B	5.6	S	3.0	R		6					GAR02
1989 08 31.38	S	5.9	AA	3.5	B		7	3.5				MOR03
1989 09 02.38	S	5.9	AA	3.5	B		7	4				MOR03
1989 09 02.51	S	5.8	S	12.5	R	7	27	5	1	1.64	304	MAC
1989 09 03.08	S	5.4	S	10.0	L	6	30	5	7	0.5	295	LUE
1989 09 03.38	S	5.9	AA	3.5	B		7	5				MOR03
1989 09 08.16	B	5.2	S	3.0	R		6		9			GAR02
1989 09 12.39	S	5.9	AA	3.5	B		7					MOR03
1989 09 23.54	S	8 :	S	12.5	R	7	27	1	6			MAC
1989 09 24.42	S	7.3	AA	15	R	5	62	0.9				MOR03

Periodic Comet Schwassmann-Wachmann 1

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1989 08 01.98	P[	13.5		20.3	T	5						GAR02
1989 08 27.00	S[	13.0		20.3	T	10	80					GAR02
1989 08 29.04	P[	13.0		20.3	T	5						GAR02
1989 09 27.02	S	13.2	AC	20.3	T	10	62	1.5	5	0.03	118	GAR02
1989 09 27.91	S	12.9	AC	20.3	T	10	62	1.5	4			GAR02
1989 09 28.91	S	13.1	AC	20.3	T	10	62	1	3			GAR02
1989 09 30.03	S	13.2	AC	20.3	T	10	62	1.3	2			GAR02
1989 09 30.91	S	13.5	AC	20.3	T	10	62	1	2			GAR02
1989 10 04.02	S	13.0	AC	20.3	T	10	80	0.8	2			GRA04
1989 12 24.76	S[	13.0		20.3	T	10	62					GAR02
1989 12 29.76	S[	13.0		20.3	T	10	80					GAR02

Periodic Comet Lovas 1 (1989p)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1989 11 22.16	S	13.5	AC	44.5	L	4	167	0.7	1			MOR03
1989 11 25.20	S	13.0:	AC	25.4	J	6	145	& 1.0	2/			BOU
1989 11 29.20	S	13.2:	AC	25.4	J	6	117	& 1.0				BOU

Φ Φ Φ

The Last 10 Comets to Receive Provisional Letter Designations

Listed below, for handy reference, are the last 10 comets which have been given letter designations (1989a is the first comet to be discovered or recovered in 1989, 1989b is the second comet..., etc.). After the "equal sign" is given the name, preceded by an asterisk (*) if the comet is a new discovery (as opposed to a recovery from predictions of a previously-known short-period comet). Also given are such values as the orbital period (in years) for periodic comets, date of perihelion, T (month/date/year), and the perihelion distance, q (in AU). Four-digit numbers in the last column indicate the *IAU Circular* containing the discovery/recovery announcement. [This list updates the previous list in the October 1989 issue, p. 56.]

Desig.			*Comet*	*P*	*T*	*q*	*IAUC*
1989c_1	=	*	Austin		4/9/90	0.35	4919
1989d_1	=		P/Schwassmann-Wachmann 3	5.4	5/19/90	0.9	4923
1989e_1	=	*	Skorichenko-George		4/11/90	1.6	4925
1989f_1	=	*	McKenzie-Russell		11/7/89	2.0	4930
1989g_1	=		P/Russell 4	6.6	7/6/90	2.2	4932
1989h_1	=		P/Van Biesbroeck	12.4	4/24/91	2.4	4936
1990a	=	*	P/Wild 4	6.2	7/2/90	2.0	4950
1990b	=	*	Černis-Kiuchi-Nakamura		3/17/90	1.07	4980
1990c	=	*	Levy		11/10/90	0.94	5017
1990d	=		P/Peters-Hartley	8.1	6/23/90	1.6	5026